DICKEY-john®
CORPORATION

**Safety Notices** ..... **1**

**Introduction** ..... **3**
- Accessories ..... 3
- Unit Overview ..... 3
- Features ..... 4
- Specifications ..... 4
- Declaration of Conformity ..... 4
- External Communication Connections ..... 5
- Printer ..... 6

**Installation** ..... **7**
- Unit Positioning ..... 7
- Connecting AC Power ..... 7
- Grain Drawer ..... 8
  - Optional Bottomless Grain Drawer ..... 8

**Navigation** ..... **9**
- Using External Devices ..... 9
- Touch Screen Button Functions ..... 10
  - Home ..... 10
  - Power Off ..... 10
  - Initiate ..... 10
  - Print ..... 10
  - Back ..... 10
  - Abort ..... 10
  - Enter ..... 10
  - USB ..... 10
  - User ..... 10
  - Instrument Information ..... 11
  - LCD Display Touch Screen Calibration ..... 11
  - Keypad ..... 11

**Password Restrictions** ..... **13**

**Setup** ..... **15**
- Product ..... 15
  - Edit Existing Product ..... 15
  - Edit Product ..... 17
  - Create Product ..... 18
  - Delete Product ..... 19
- Load New Product ..... 20
- Administrative Settings ..... 22
  - To Change a Known User Name/Password ..... 22
  - To Reset a User Name/Password ..... 22
- System Setup ..... 23
  - Printer Setup ..... 23

DICKEY-john®

**Setup continued ..... 25**
Printer/Scale Setup ..... 25
Printer Setup ..... 25
Language Settings ..... 27
Locale Setting ..... 28
Time ..... 29
Result Settings ..... 30
Export Data Format ..... 31
Units ..... 32
Sample Setup ..... 33
Owner Data ..... 34
Service Data ..... 35
LCD Display Touch Screen Calibration ..... 36

**Startup ..... 37**
Power Down ..... 38

**Analyzing Grain ..... 39**
User Login (Optional) ..... 39
User Login ..... 40
User Log Off ..... 40
Selecting Product ..... 40

**Results ..... 45**
Refine Query Options ..... 46
Print Only Last Number of Records ..... 46
All Products ..... 46
Product Like ..... 46
User Like ..... 47
Sample ID Like ..... 47
Data Storage Capacity ..... 48
Audit Trail ..... 49
View Products ..... 51

**Grain Calibrations ..... 53**

**Maintenance ..... 55**
External Cleaning ..... 55
Internal Cleaning ..... 55
LCD Display ..... 56

**Troubleshooting ..... 57**
Error Messages ..... 58

**Warranty ..... 61**

DICKEY-john®
CORPORATION

# SAFETY NOTICES

Safety notices are one of the primary ways to call attention to potential hazards. An absence of specific alerts does not mean that there are no safety risks involved.

**This Safety Alert Symbol identifies important safety messages in this manual. When you see this symbol, carefully read the message that follows. Be alert to the possibility of personal injury or death.**

**⚠WARNING**

**Use of the word WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

**⚠CAUTION**

**Use of the word CAUTION with the Safety Alert Symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

**CAUTION**

**Use of the word CAUTION without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in equipment damage.**

DICKEY-john
CORPORATION

# INTRODUCTION

The DICKEY-john Grain Analysis Computer GAC® 2500 quickly tests grain and automatically calculates moisture content, temperature, and test weight (density) of the sample. The unit prompts for sample loading, tests the sample, and displays the results.

## ACCESSORIES

The following list of components are included with the unit and can be ordered as replacement parts:

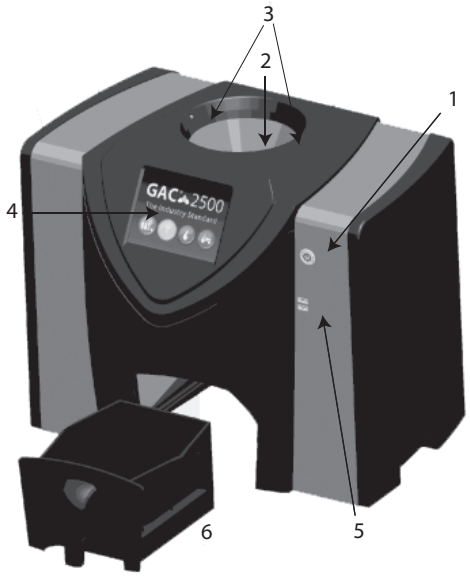
- 110V power cord p/n 203150002
- 220V power cord p/n 203150005 (international optional/not currently available)
- Operator's manual p/n 11001-1505
- Cleaning brush p/n 206410003
- Grain drawer p/n 468071541
- Grain drawer bottomless (optional) p/n DRAWEROPGAC2500

## UNIT OVERVIEW

1. Power (on/off) button
2. Hopper
3. Hopper full sensors
4. Touch screen display
5. USB connections (2) front (2) back
6. Sample drawer

***Figure 1***

***GAC2500 Overview (Front of Unit)***



## FEATURES

- Color touch screen display guides users through testing and setup
- Easy-to-use user interface
- Fast, accurate grain analysis
- One core calibration for all grains
- Alpha/numeric sample identification with the ability to add an optional extended keyboard or bar code reader via USB
- Error messages display when out-of-limits moisture, grain weight, or grain temperature occur
- Customizable work environment
- Optional password protection
- Storage of 30,000 grain tests
- Large storage to handle complete grain calibration library
- Internal memory capacity to handle future upgrades
- Printing capabilities
- A variety of external communication options
- English language capability (additional languages to be added)

## SPECIFICATIONS

- Operating temperature: 36 to 113 degrees F (2 to 45 degrees C)
- Power: 110/220V, 50/60 Hz, 30/35 VA
- Humidity: 20 to 90% noncondensing
- Grain temperature: 32 to 113 degrees F (0 to 45 degrees C)
- Storage/transit temperature: -4 to +140 degrees F (-20 to +60 degrees C)
- Moisture range: 5 to 45% (grain dependent)
- Approximate Weight: 25 lbs.
- Approximate dimensions: 17"H x 19"W x 14"D

## DECLARATION OF CONFORMITY

The GAC® 2500 is in conformity with the provisions of the following directives and regulations:

- EN2006/95/EC Low Voltage Directive
- EN2004/108/EC EMC Directive
- EN61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use operating at a maximum altitude of 6562 feet (200 meters)
- CAN/CSA - C22.2 NO. 61010-1 and ISA - 82.02.01 (IEC 61010-1 MOD) and UL61010-1
- NTEP GRAIN ANALYZE (NCWM publication 14 and NIST Handbook 44)

**EMC**

EMC conformity to EN 61326-1:2006 (Electrical Equipment for Measurement, Control, and Laboratory use) as follows:

**Immunity**

- Radiated RF field EN 61000-4-3 (2002)
- Conducted RF voltage EN 61000-4-6 (1996) + A1 (2001)
- Fast transient/burst EN 61000-4-4 (2004)
- Electrostatic discharge (ESD) EN 61000-4-2 (1995) + A1 (1998) + A2 (2001)
- Surge EN 61000-4-5 (1995) + A1 (2001)
- Voltage dips and interruptions EN 61000-4-11 (2004)

**Emission**

- Radiated emission CISPR II:2003 + A1: 2004
- Conducted emission CISPR II:2003 + A1: 2004

## EXTERNAL COMMUNICATION CONNECTIONS

- 4 USB connections (2 in front, 2 in back) allow for a keyboard, mouse, printer or flash drive to be connected.
- 1 USB connection to connect the GAC®2500 to a PC for downloading of software to the device, installing calibrations, or remotely accessing data from the instrument.
- 1 RS232 serial port printer connection

***Figure 2***

***External Communication Connections (Back of Unit)***

**CAUTION**

**Appropriate space must be left around the input power connector to allow easy disconnection at the unit.**

## PRINTER

An optional printer that is RS232 compatible or a USB printer that supports Printer Control Language (PCL) can connect to the GAC® 2500 to print test data results to a ticket. The ticket can be setup to include the facility name and address, product, date and time, sample ID, customer ID, grain calibration date, percent moisture, grain temperature, test weight, and errors. The data can be automatically printed at the end of each measurement cycle or manually initiated by pressing the **Printer** button.

***Figure 3***

***Printer***

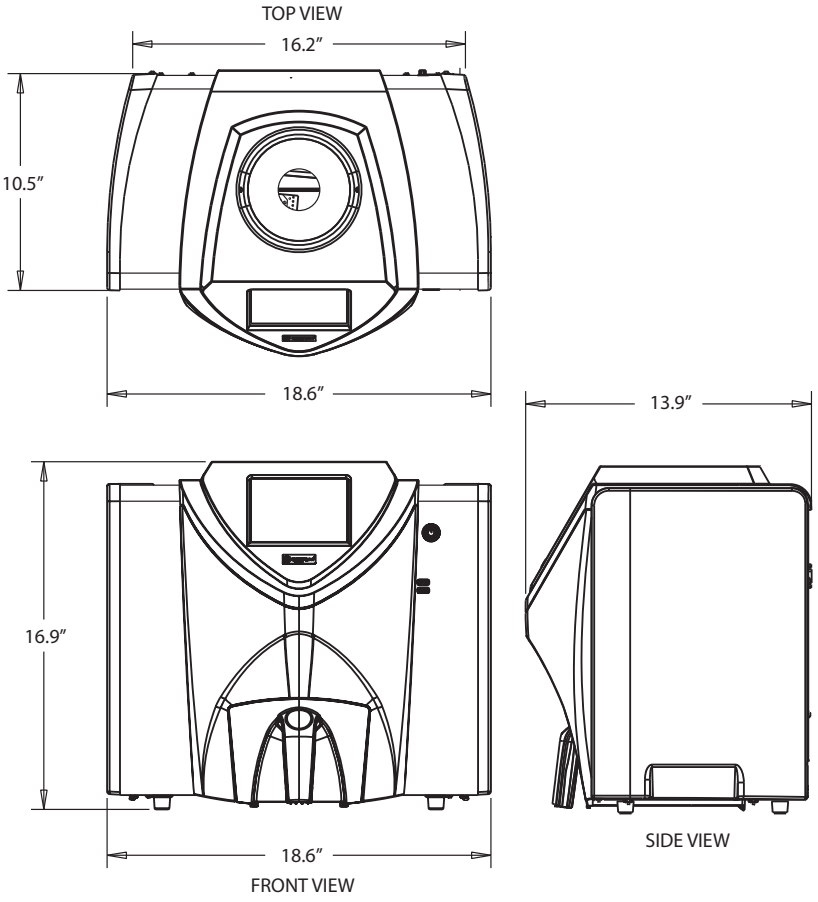
# INSTALLATION

The GAC® 2500 unit requires minimal setup. The unit is fully assembled and ready for operation after attaching the AC power cord and inserting the grain drawer.

*NOTE: After unpacking, visually inspect for damage occurring during transit. Save all packing materials until inspection is complete. If damage is found, file a claim with the carrier immediately and notify your DICKEY-john sales representative.*

***Figure 4***

***Unit Dimensions***




## UNIT POSITIONING

Place the unit in a clean environment that is protected from rapid changes in ambient temperature and vibration. Avoid a hazardous (classified) location as defined in Article 500 of the NFPA Handbook of the National Electrical Code.

## CONNECTING AC POWER

1. Securely connect power cord into the AC plug connection (Figure 2) located on the back of the unit.
2. Plug the male end into an appropriate 3-wire (grounded) outlet.

**⚠CAUTION**

**The grounding pin on the line cord connects directly to the GAC® 2500 frame. When using an adapter ensure the grounding wire is connected properly to a good earth ground to prevent a shock hazard.**

## GRAIN DRAWER

The unit is equipped with a standard grain drawer with handle. An optional bottomless grain drawer is available for purchase from DICKEY-john.

### OPTIONAL BOTTOMLESS GRAIN DRAWER

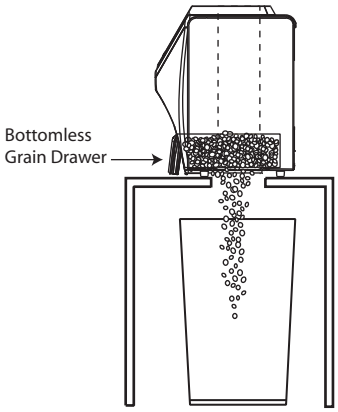
Part Number: DRAWEROPGAC2500

A bottomless grain drawer is used with a flow-through work counter that allows the tested grain samples to fall through to a larger container below. The size of the hole must be at least equal to the drawer dimension and located directly beneath the grain sample drawer.

*NOTE: Contact DICKEY-john Technical Support at 1-800-637-3302 for additional information on grain drawers.*

***Figure 5***

***Flow Through Work Counter***



# NAVIGATION

The user interacts with the GAC® 2500 via the LCD touch screen display. Screen interaction by finger touch or using a dull, pointed object, such as a stylus or pen is recommended.

Refer to Maintenance section for cleaning display.

**CAUTION**

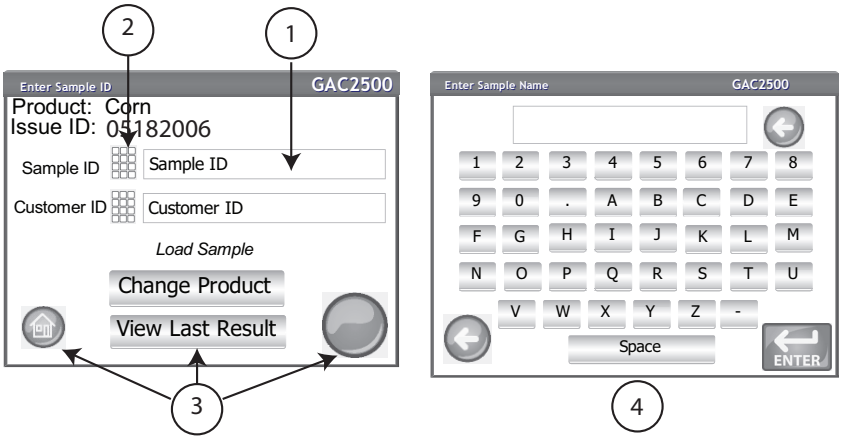
**Do not use any sharp objects on the display. Damage to screen can result.**

The following methods are used to navigate through and interface with the unit:

1. Text input boxes
2. Keypad icon (enables keyboard)
3. Buttons
4. Keyboard

***Figure 6***

***LCD Touch Screen Display***




## USING EXTERNAL DEVICES

The following external devices can be used to enter data and navigate through the screens by connecting to the USB ports (2 front/2 back):

- keyboard
- mouse
- barcode scanner

DICKEY-john®

# TOUCH SCREEN BUTTON FUNCTIONS

## HOME

**Home** button is available on most screens and, when pressed, returns to the Main Menu screen.

## POWER OFF

**Power Off** button turns the system off from the touch screen display. The system must be turned on using the On/Off button located on the front panel but can be turned off from either the screen display or the On/Off button.

## INITIATE BUTTON

The **Initiate** button is used to analyze grain and has 3 states of operation:

Green = proceed to begin test

Yellow = an action is required to proceed

Red = system cannot process; error has occurred

## PRINT

**Print** button allows printing test results to a local printer. Refer to the Setup section for print requirements.

## BACK

**Back** button returns to the previous screen.

## ABORT

**Abort** button dumps grain from hopper, empties the cell, and aborts test.

## ENTER

**Enter** button accepts action taken and proceeds to next screen.

## USB

**USB** button is used when connecting the unit direct to a computer for downloading software and installing calibrations.

## USER

**User** button appears on the Main Menu screen only if a User ID has been enabled in System Setup. Requires a tester to enter a User Name before a grain analysis can proceed and will print on a ticket.

## INSTRUMENT INFORMATION

**Instrument Information** button appears on the Main Menu screen providing details regarding unit service date, serial number, and software version. Typically used for troubleshooting purposes.

## LCD DISPLAY TOUCH SCREEN CALIBRATION

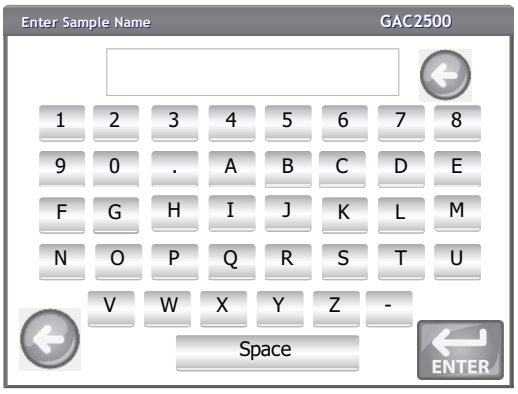
**Display Touch Screen Calibration** button re-calibrates the display when screen responsiveness does not occur effectively to a finger touch or stylus.

## KEYPAD

The **Keypad** icon appears on those screens that require text entry. Pressing the Keypad icon opens the virtual keyboard for typing text on the screen. The virtual keyboard is used when an external keyboard, mouse, or barcode scanner are not available.

***Figure 7***

***Keyboard***



# PASSWORD RESTRICTIONS

Setting an Admin user name and password to restrict system settings to be controlled by an administrator are optional. The unit is shipped with an Admin user name and password setting of "GUEST".

Keeping the Admin user name and password as "GUEST" retains the unit in open access mode allowing any user to enter System Settings and modify unit settings.

**IMPORTANT: To restrict access to System Setup that affects overall unit functionality, a new Admin user name and password must be created.**

**To Create an Admin User Name and Password:**

1. At the Main Menu screen, press the **Setup** button.
2. Leave the Admin Username and Password as GUEST and press the **Enter** button.
3. At the Setup screen, press the **Admin Settings** button.
4. At the Enter New Password screen, press the Admin Username keypad icon and enter an administrator user name.
5. Press the **Enter** button to accept.
6. Enter a Password and re-enter password to confirm.
7. Press the **Enter** button to accept.

*NOTE: An external keyboard, barcode scanner, or mouse can be used to enter data into the unit.*

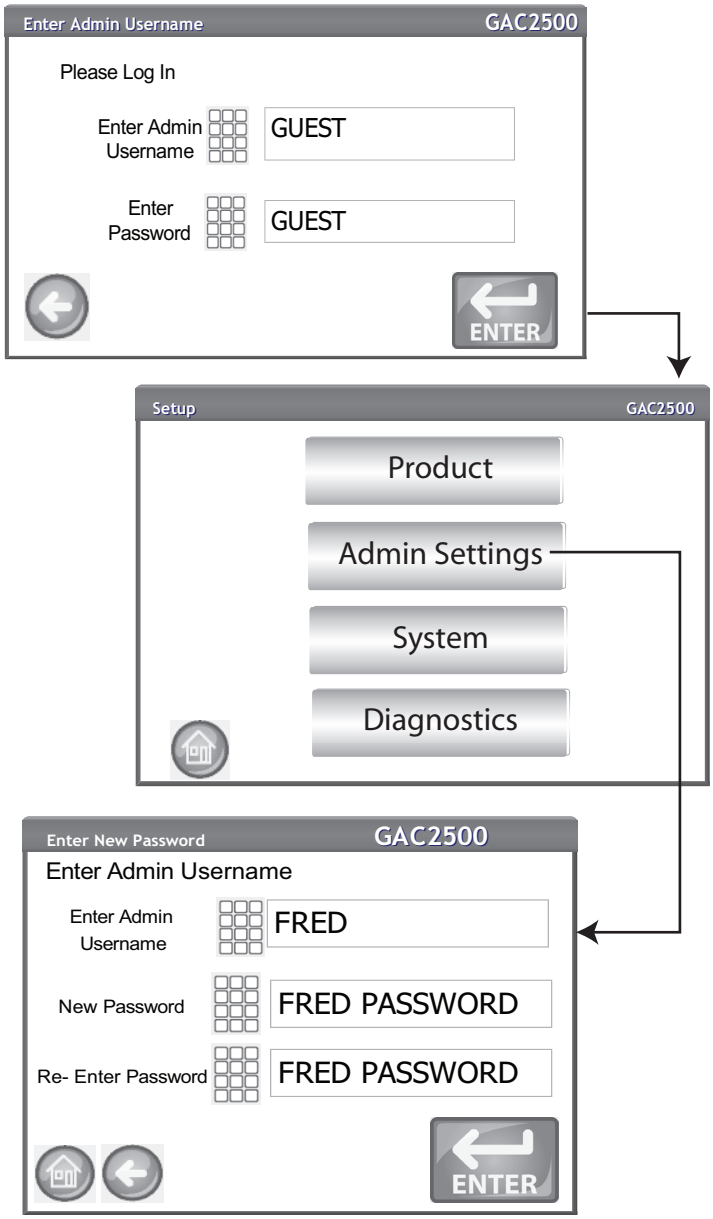
Once a new password is created, the unit is configured so that an administrator name and password is required to gain entry into the System Setup screens. Password and User Name can be any combination of letters and numbers.

Refer to Administrative Settings in the System Settings section to change an Administrator user name and password or reset to open access.

**IMPORTANT: The following words are restricted to system functionality and cannot be used as User Names (ROOT, GUEST, REBOOT, RESET).**

***Figure 8***

***Password Screen***



# SETUP

Setup establishes basic unit operating parameters and allows customization of the user interface by:

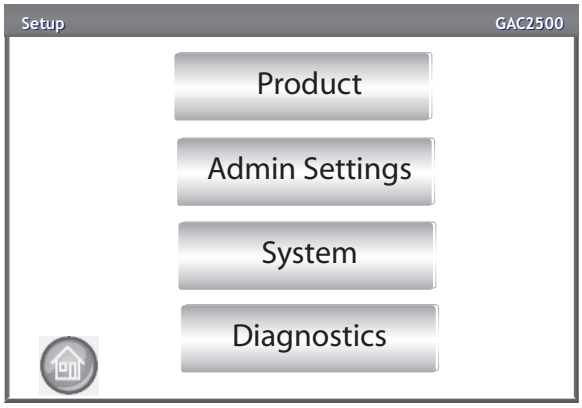
- Editing an existing product and loading new products (Product button)
- Setting administrative levels (Admin Settings button)
- Setting system parameters for external devices, language/locale preferences, time/date, sample result output, unit measurement, sample/customer ID's, and printing formats (System button)
- Diagnostics for troubleshooting and unit information (Diagnostic button)

**To View Setup Options:**

1. At the Main Menu screen, press the **Setup** button.
2. Enter User Name and Password, if required, and press the **Enter** button to display the Setup screen. If defaulted to Name (Guest) and Password (Guest) press the **Enter** button.

***Figure 9***

***Setup Screen***




## PRODUCT

The Product screen is used to:

- Edit existing products
- Load new products

### EDIT EXISTING PRODUCT

If for any reason non-NTEP calibrations need to be adjusted, certain product parameters can be changed as follows:

*NOTE: NTEP calibrations are regulated and cannot be altered.*

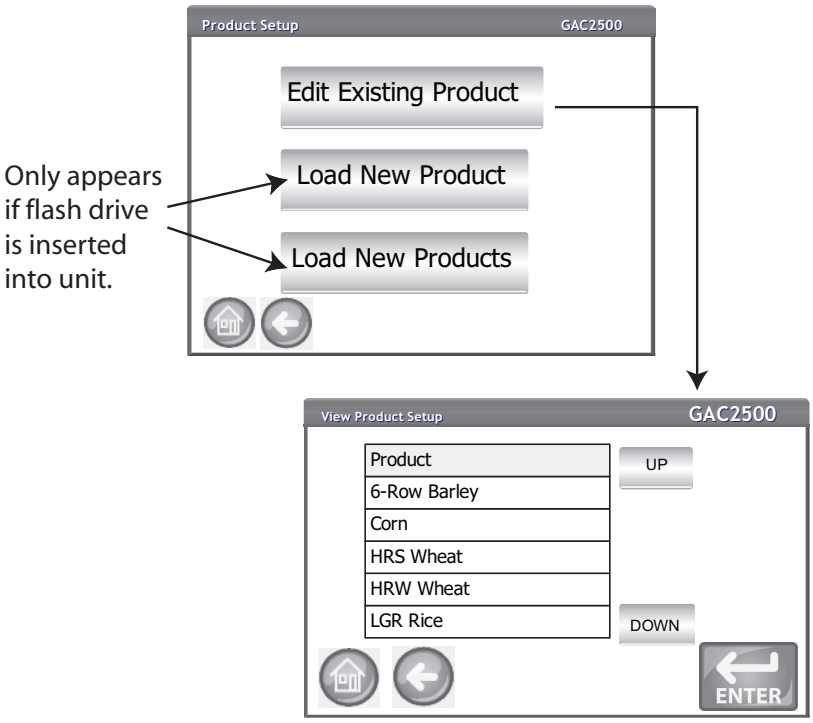
- Modifying moisture and test weight bias and moisture and test weight slopes
- Creating a new product by copying a similar product (duplicated and saved using a different name and Issue ID)
- Deleting an existing product from appearing on active screens

**To Edit an Existing Product:**

1. At the Product Setup screen, press the **Edit Existing Product** button.
2. At the View Product Setup screen an alphabetical product list appears. Press the **Up** or **Down** button to display additional products.

***Figure 10***

***Edit Existing Product Screens***




3. Press the desired product to highlight and press the **Enter** button to select. Once the product is selected, the product's parameters display in a table.
4. Select the desired action:
   – Edit product (does not display on screen for NTEP calibrations)
   – Create product
   – Delete product

## EDIT PRODUCT

A product's moisture bias, test weight bias, moisture slope, and test weight slope can be changed at this screen. All NTEP calibrations are locked and cannot be modified. A product's calibrations should only be changed by an authorized user.

*NOTE: A product's detail at the View Product Setup screen can be printed by pressing the **Print** button.*

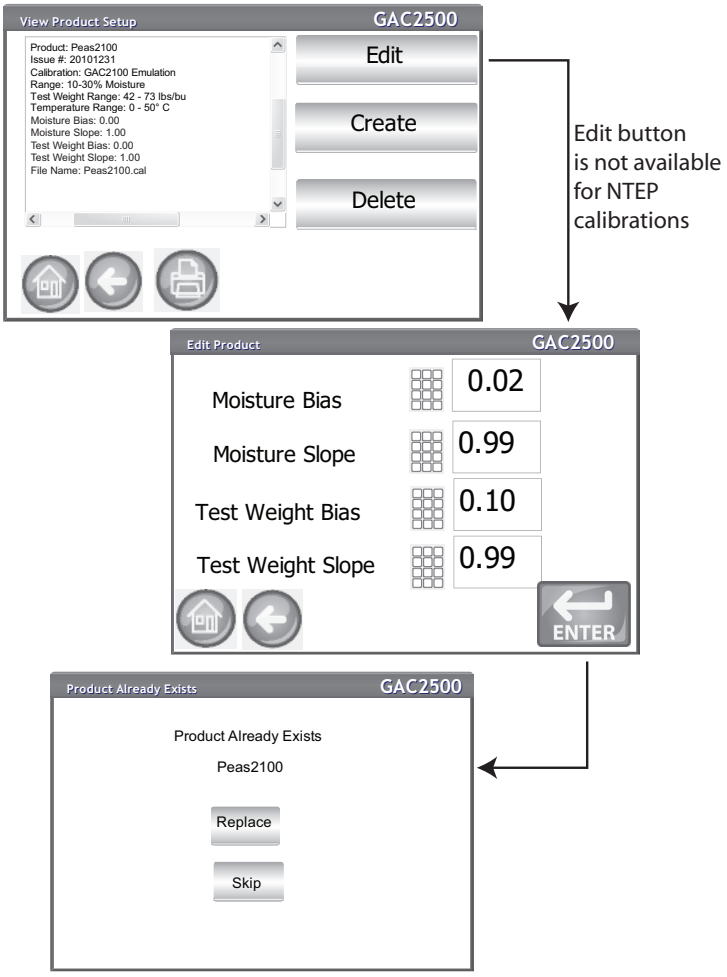
**To Edit a Product:**

1. At the View Product Setup screen, press the **Edit** button.
2. At the Edit Product screen, press the keypad icon to modify a product's parameters.
3. When finished, press the **Enter** button.
4. Confirm product replacement by pressing the **Replace** button at the Product Already Exists screen. The **Skip** button returns to the previous product's bias and slope setting.
5. The new bias and slope appears in the product table on the View Product Setup screen. The product name and Issue ID will remain the same.

*NOTE: An external keyboard, barcode scanner, or mouse can be used to enter data into the unit.*

***Figure 11***

***Edit Product***



## CREATE PRODUCT

A new product can be created by copying a similar product's parameters. Creating a new product name and Issue ID prevents an existing product's parameters from being overwritten.

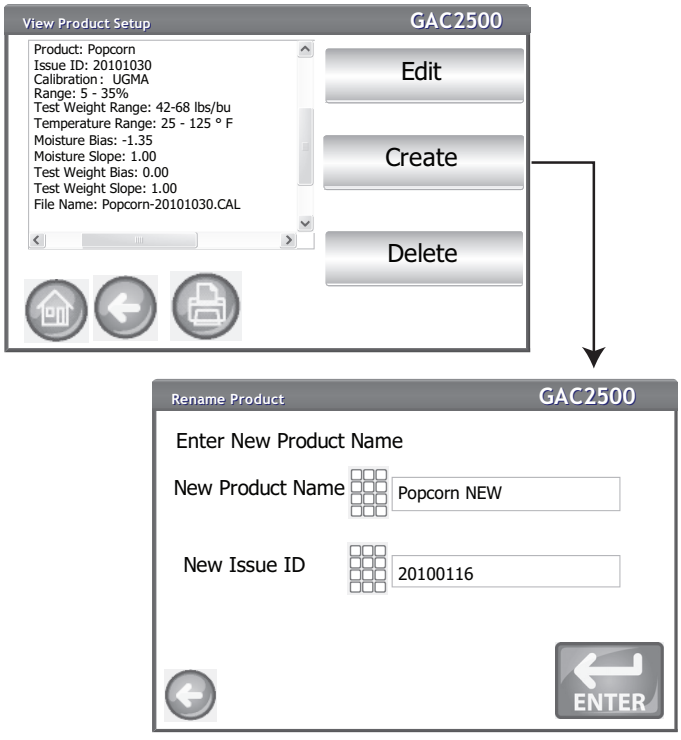
*NOTE: An external keyboard, barcode scanner, or mouse can be used to enter data into the unit.*

**To Create a Product:**

1. At the View Product Setup screen, press the **Create** button.
2. At the Rename Product screen, the product name and NEW appears as the default name.
3. Press the keypad icon to enter a different product name, if desired.
4. A new Issue ID is automatically defined for the new product. Press the keypad icon to enter a different Issue ID, if desired.
5. Press the **Enter** button to save.

***Figure 12***

***Creating a Product Screen***



## DELETE PRODUCT

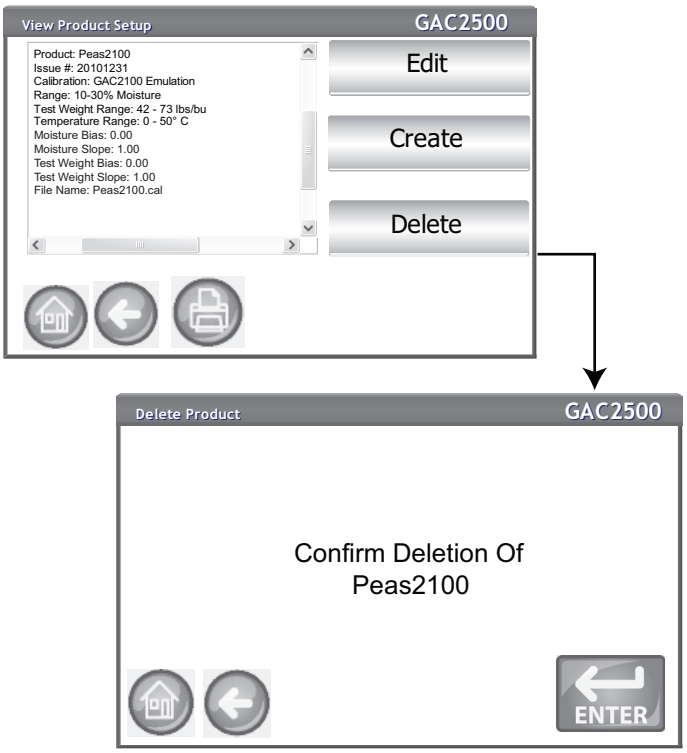
A product and its calibrations can be deleted so that it does not appear on the active user screens. A product and its history is stored in the unit's database and can still be viewed on the Audit Trail screen after it has been deleted.

**Deleting a Product:**

1. At the View Product Setup screen, press the **Delete** button.
2. At the Delete Product screen, press the **Enter** button to confirm deletion.

***Figure 13***

***Delete Product Screen***



## LOAD NEW PRODUCT

New product calibrations can be loaded to the GAC® 2500 using either a USB memory device or connecting the unit direct to a PC. The **Load New Product buttons** only appear when a USB memory device is inserted in the unit.

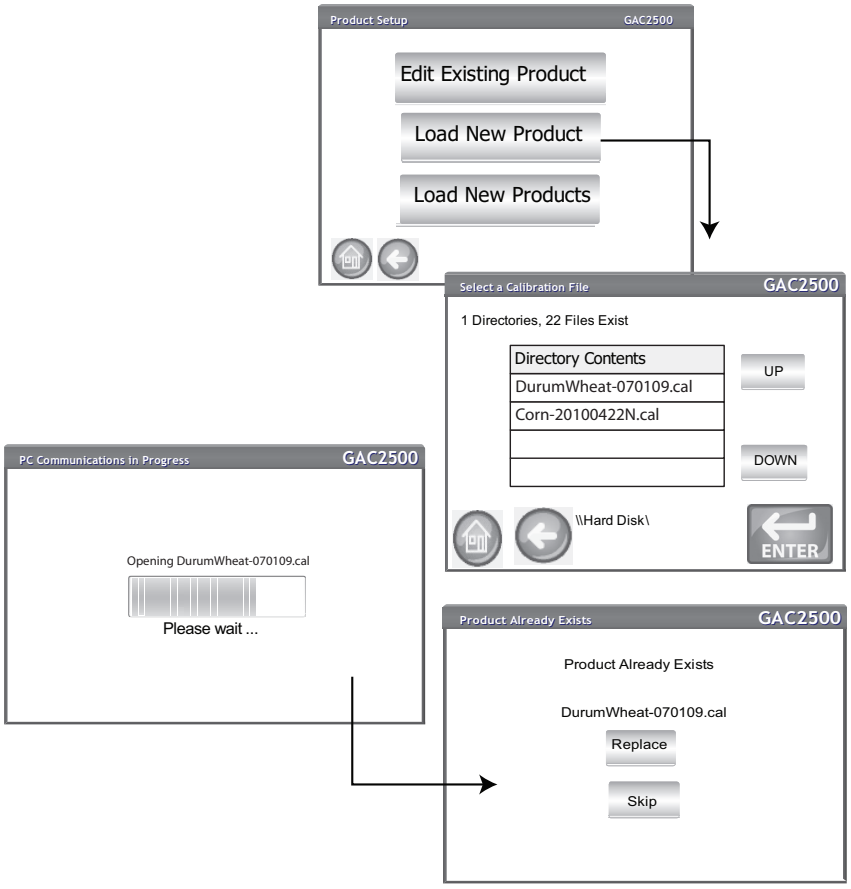
**To Load a Single Product:**

1. Insert the USB memory device to the unit's USB port on front panel of unit or connect cable to the unit's USB (B) drive and to the PC.
2. At the Product Setup screen, press the **Load New Product** button.
3. Navigate to the directory where the product is located, press on the product name to highlight, and press **Enter** to begin download. A progress bar indicates downloading status.
   – A single tap is required to select the desired file.
   – Pressing "..\" located at the top of the list returns to previous level in the directory structure.
4. If a product calibration already exists on the instrument, accept the new calibration by pressing the **Replace** button or the **Skip** button to revert to the existing product.

*NOTE: Contact DICKEY-john Technical Support at 1-800-637-3302 for assistance with obtaining updated calibrations or with transferring data to the unit.*

***Figure 14***

***Load New Product Screen***



**To Load Multiple Products:**

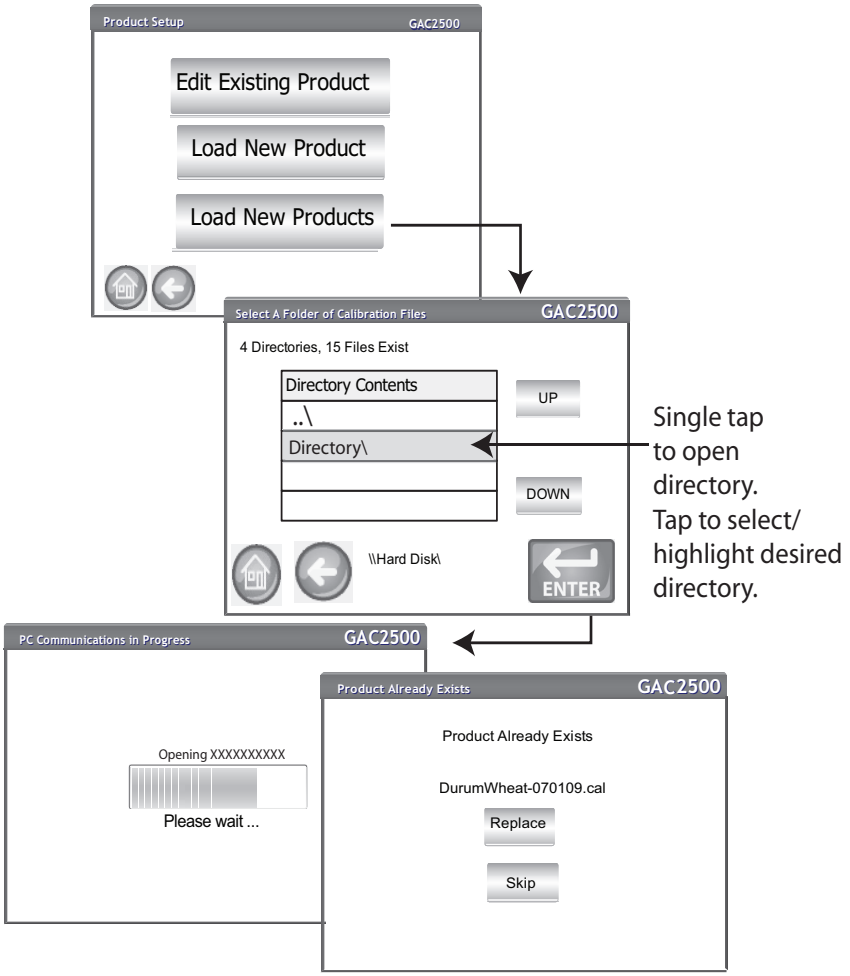
*NOTE: Product calibrations are available for download at DICKEY-john's website. www.dickey-john.com/products/Agriculture/Moisture Testing/GAC2500/Get Support/Downloads.*

1. Insert the USB memory device to the unit's USB port on front panel of unit or connect cable to the unit's USB (B) drive and to the PC.
2. At the Product Setup screen, press the **Load New Products** button to load all products from the selected directory of the memory device or PC.
3. When loading multiple products, navigate through the directory structure and highlight the directory containing the desired products to load. A progress bar indicates downloading status.
   – A single tap selects the desired directory.
   – Pressing "..\" located at the top of the list returns to the previous level in the directory structure.
4. Press the **Enter** button to begin download.
5. If product calibrations already exist on the instrument, accept new calibrations by pressing the **Replace** button or the **Skip** button to revert to the existing product.

*NOTE: You must know the directory where the files are saved as names do not display.*

***Figure 15***

***Load Multiple Products Screens***



# ADMINISTRATIVE SETTINGS

If the instrument is set with an administrator password, the password can be changed or the instrument can be reset to open access mode.

*NOTE: Refer to the Setting Password Restrictions section for creating a user name and password.*

## TO CHANGE A KNOWN USER NAME/PASSWORD

1. At the Main Menu screen, press the **Setup** button.
2. At the Password Login screen, enter existing user name and password.
3. At the Setup screen, press the **Admin Settings** button.
4. At the Admin Settings screen, press the keypad icon and enter a new Admin Username.
5. Enter New Password and re-enter password for verification.
6. Press the **Enter** button to accept changes.

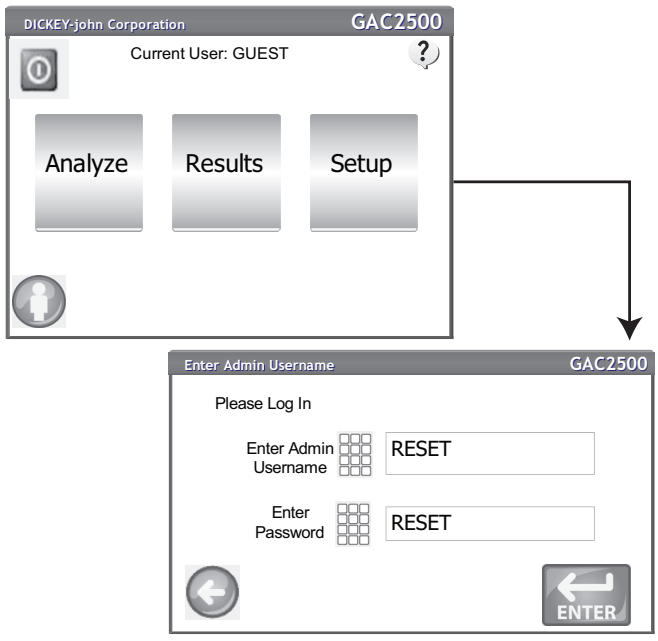
## TO RESET A USER NAME/PASSWORD

The instrument can be reset to open access if an administrator setting is no longer desired or if the administrator name and password is forgotten. Password name RESET must be entered in All Caps.

1. At the Main Menu screen, press the **Setup** button.
2. At the Admin Username screen, use the keypad icon to enter the User Name as RESET.
3. Enter a password name of RESET.
4. Press the **Enter** button to accept. Once the **Enter** button is pressed, the existing password is cleared from the instrument. The instrument is now reset to open access.
5. The Username and Password will default to GUEST when the Setup screens are accessed.

***Figure 16***

***Reset Username and Password***



# SYSTEM SETUP

System Setup allows customization of the unit's functionality and print settings:

- Printer/scale setup
- Language selection
- Locale selection
- Time and date setup
- Test result settings (automatic, manual return)
- Printing setup (print ticket)
- Units of Measurement
- Sample setup (sample, user ID)
- Exporting data format (CSV, Excel)
- Owner data (troubleshooting information)
- Service information

## PRINTER SETUP

A USB or RS232 serial port connection is available to connect a printer that prints test data results to a ticket.

The ticket can be customized to include details as it relates to facility, date, time, testing errors, and product results. The unit can be set to automatically or manually print a ticket at the end of each test.

*NOTE: Reference the printer's specifications for correct settings.*

**To Set Printer Settings:**

1. At the System Setup screen, press the **Printer** button.
2. At the Printer Setup screen, enable the check box for the type of connection between the unit and printer:
   – RS232 connection using a Null modem cable
   – PCL USB when connecting to a PCL USB printer
   – Star USB when connecting to an SP712 USB printer
3. For an RS232 connection, select the Baud Rate, Byte Size, Parity, and Stop Bits that match the printer.
4. When sending results to a printer, a Header and Footer can be added to print on each ticket, if desired.
5. Press the **Test** button to verify that the printer and/or computer and the unit's print settings match for proper communication between the devices.
6. When enabled, **Automatically Print Upon Sample Result** will print a ticket at the end of each test.
7. When enabled, **Include Line Feeds After Print** allows additional line feeds to be added at the end of each ticket after printing.

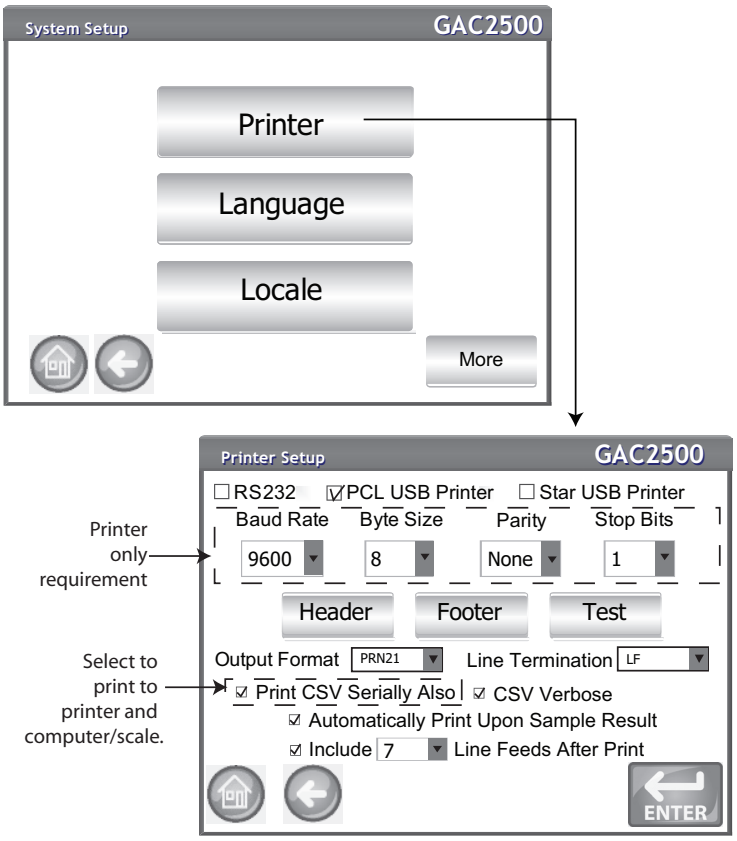
*NOTE: When printing to a database using an RS232 connection and CSV printer output format, a line feed of 1 is required for a carriage return/line feed.*

8. Select the output format.
   – PRN20 - Standard 20 column printer output
   – PRN21 - Special 20 column printer output
   – PRN80 - Standard 80 column printer output (80 characters per line)
   – PRN81 - Standard 80 column printer output (81 characters per line)
   – CSV01 - Comma separated variables (requires a 9600 baud rate) selected when test results are sent to a computer.
   – NTEP - A detailed printout that includes engineering data and test results used by the National Conference on Weights and Measures.

9. Select the line termination style.
   – CR - Carriage return
   – CRLF - Carriage return, line feed
   – LF - Line feed
   – LFCR - Line feed, carriage return
10. Print CSV Serially Also--Enable this selection when test results are sent to both a printer and a computer. Baud rate, byte size, parity, and stop bits must also be defined to match the RS232 computer output. Example: If a customer wants to use a USB strip printer and an RS232 scale interface both features can be turned on.
11. CSV Verbose--When enabled, subject headers print with results in comma separated variable format. When disabled, results print with no headers.

***Figure 17***

***Printer Setup Screens to add a Header and Footer to a Ticket***




*NOTE: An external keyboard, barcode scanner, or mouse can be used to enter header and footer information.*

**To Add a Header and Footer to a Ticket**

Header and Footer text can be added to print on a print ticket. Owner Data text can be selected as the default or customized text can be entered.

**To Enter a Header/Footer:**

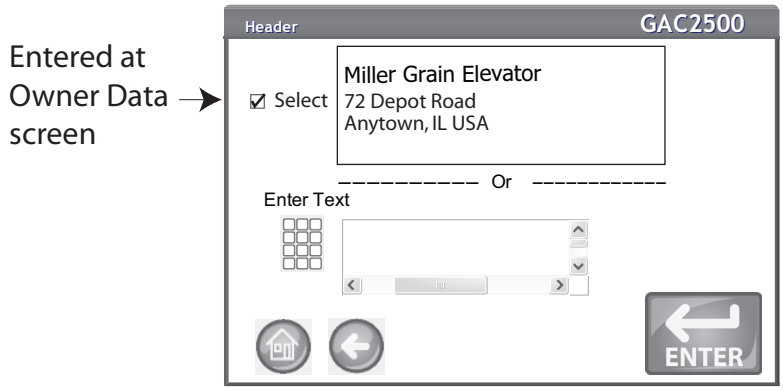
1. At the Printer Setup screen, press the **Header** button.
2. To use the Owner Data address information, enable the check box next to the company name and address. If the owner data text box is blank,

owner data information has not been entered at the Owner Data screen and can be entered at the System Setup screen, **Owner Data** button.

3. To enter other text, deselect the Owner Data check box.
4. Press the keypad icon on the screen of the lower text box to open the unit's keyboard and enter desired text.
5. Press the **Enter** button to accept.
6. If desired, enter a footer name by pressing the **Footer** button. Enter desired information to appear in footer.

***Figure 18***

***Header Screen***




# PRINTER/SCALE SETUP

## PRINTER SETUP

The GAC 2500 can be set to print test data results to a ticket via a printer as well as interface with a scale. To interface with a printer and scale certain parameters must be selected on the Printer Setup screen:

1. At the System Setup screen, press the **Printer** button.
2. Baud Rate must be set at 9600 to communicate with a scale. At the Printer Setup screen verify the Baud Rate of 9600 is selected.
   – The RS232 checkbox must be selected to view the Baud Rate.
3. To interface with a printer and scale, check either the PCL or Star USB checkbox.
   – When the USB box is checked, the unit can output to both the USB and RS232 port. The USB port communicates with the printer and can operate with any printer output format (step 5).

**IMPORTANT: When the output desired is to a scale and a printer via USB, Print CSV Serially Also and a Baud Rate of 9600 must be selected.**

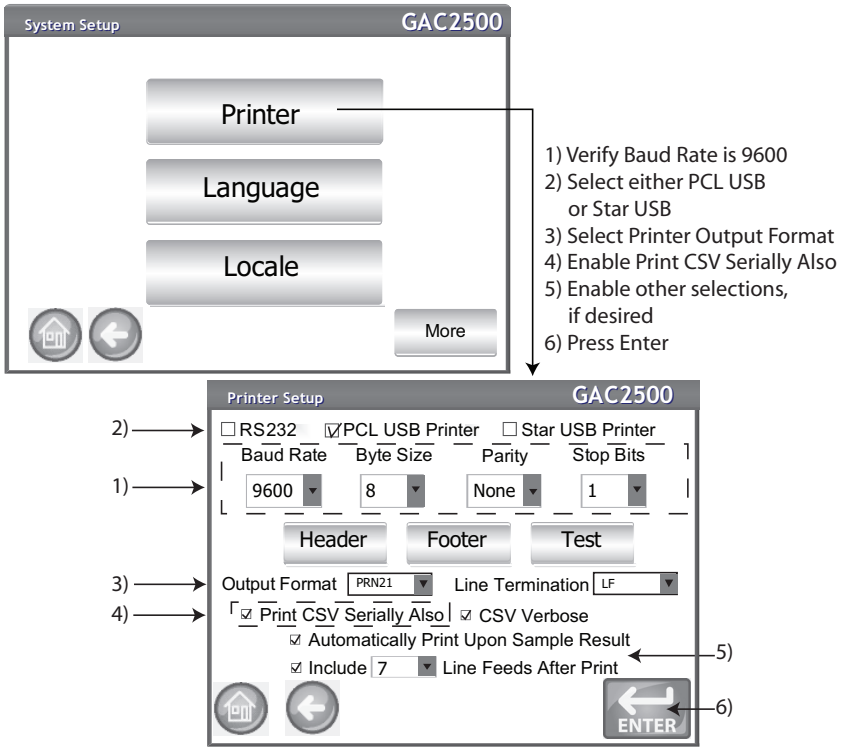
4. To interface with a scale only, check the RS232 box.

5. Select the output format for the printer.
   - PRN20 - Standard 20 column printer output
   - PRN21 - Special 20 column printer output
   - PRN80 - Standard 80 column printer output (80 characters per line)
   - PRN81 - Standard 80 column printer output (81 characters per line)
   - CSV01 - Comma separated variables (requires a 9600 baud rate) selected when test results are sent to a computer.
   - NTEP - A detailed printout that includes engineering data and test results used by the National Conference on Weights and Measures.
6. Select the line termination style.
   - CR - carriage return
   - CRLF - carriage return, line feed
   - LF - line feed
   - LFCR - line feed, carriage return
7. When enabled, **Automatically Print Upon Sample Result** will automatically print a ticket at the end of each test.
8. When enabled, **Include Line Feeds After Print** allows additional line feeds to be added at the end of each ticket after printing.
9. Press the **Enter** button to accept changes.

*NOTE: When printing to a database or scale using an RS232 connection and CSV printer output format, a line feed of 1 is required for a carriage return/ line feed.*

***Figure 19***

***Scale and Printer Setup***



## LANGUAGE SETTINGS

The unit is equipped with a set of various languages that displays the user screens in the language selected. Language default is English (US).

Available Languages:

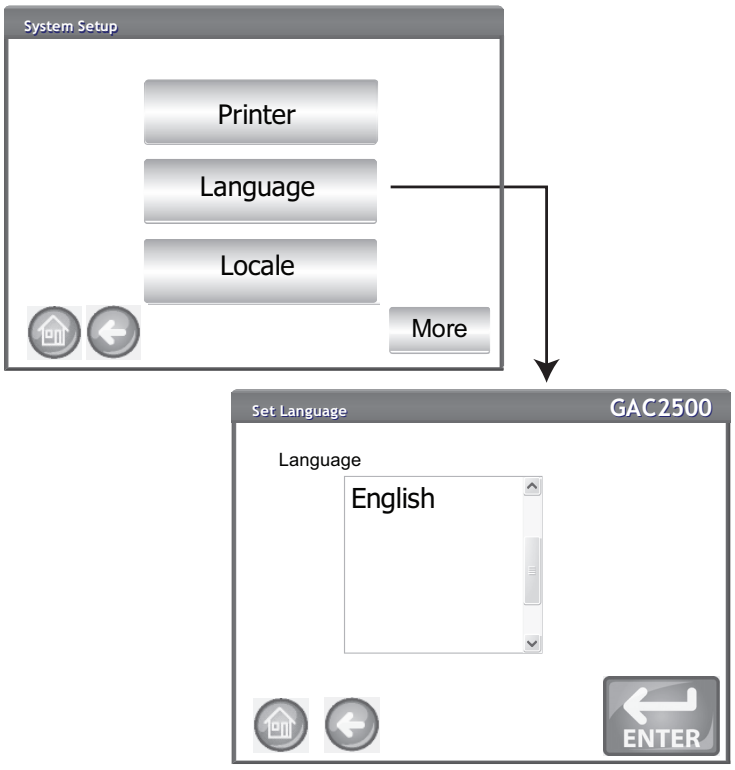
- English
- Additional languages will be available on future releases. Contact Technical Support at 1-800-637-3302 for release dates and available languages.

**To Select a Language:**

1. At the System Setup screen, press the **Language** button.
2. At the Language screen, press the desired language and press **Enter**.
3. Unit will automatically convert to the selected system language.

***Figure 20***

***Language Screen***



## LOCALE SETTING

Locale allows selection of a specific region/area by language that will use the calibrations relevant for that region. The active locale setting appears in the header on the Product Selection screen when analyzing grain. Locale default is United States (US).

**Available Locales:**

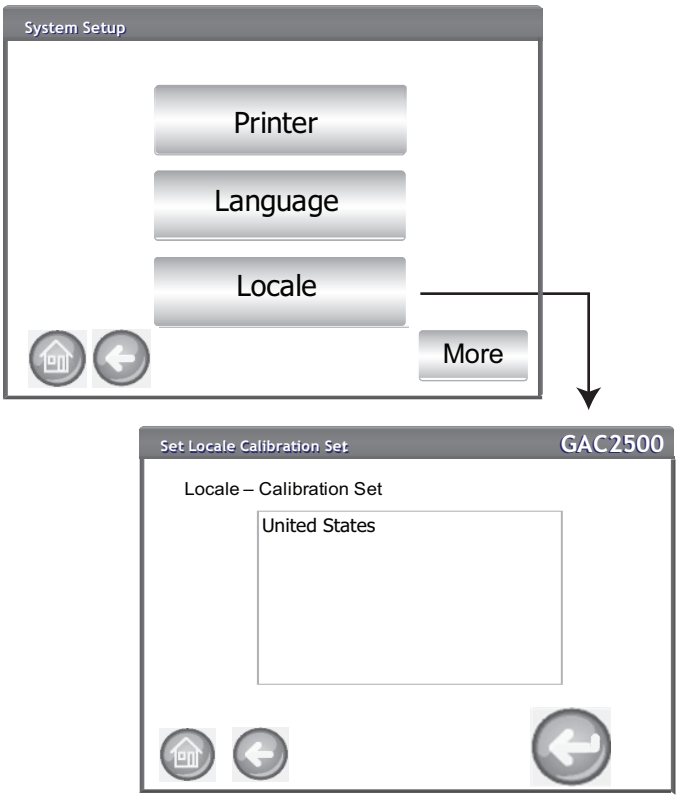
- United States (US)
- Additional locales will be available on future releases. Contact Technical Support at 1-800-637-3302 for release dates and available locales.

**To Change Locale:**

1. At the System Setup screen, press the **Locale** button.
2. At the Locale screen, press the desired locale to highlight and press **Enter** to confirm.
3. System will automatically convert to the selected Locale setting.

***Figure 21***

***Locale Screen***



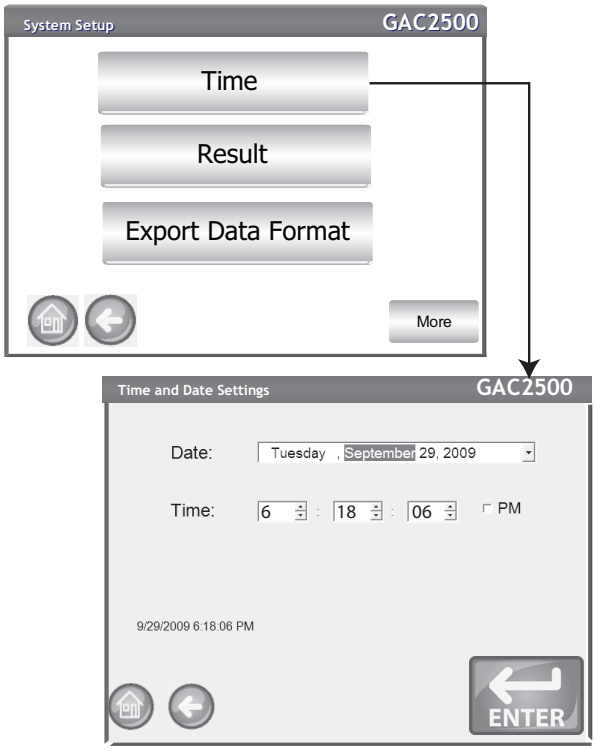
## TIME

*NOTE: The date can be changed to US or UK format at the Units screen.*

1. At the System Setup screen, press the **Time** button.
2. To select a date, press the Date drop down arrow to display calendar.
3. Use arrows to change the month.
4. Enter time using the up/down arrows.
5. Select PM check box, if applicable.
6. Press the **Enter** button when done.

***Figure 22***

***Time and Date Screen***



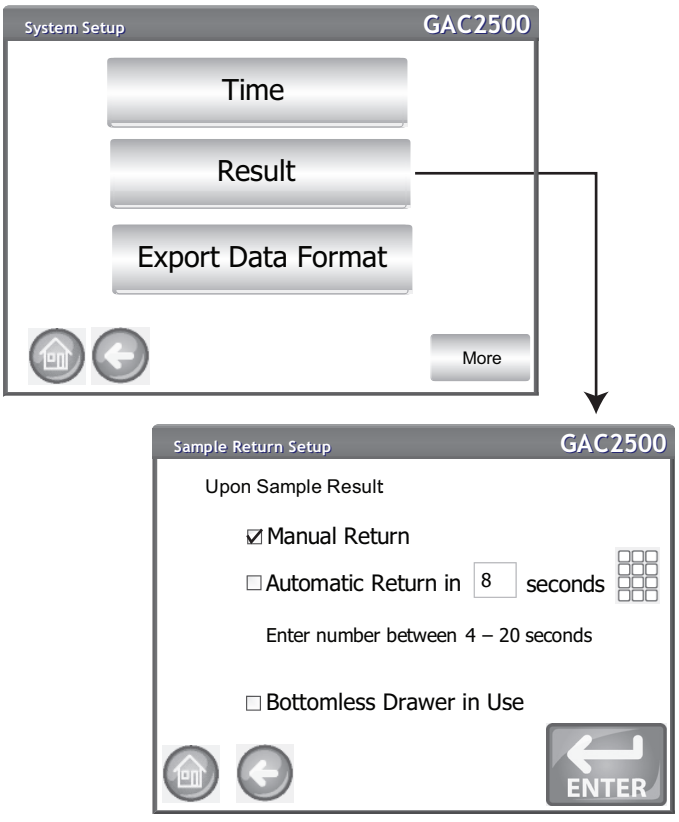
## RESULT SETTINGS

After performing a grain analysis, the unit can be set to automatically advance back to the Sample ID screen from the Analysis Results screen or manually return to this screen with a button press. The unit default is set to manual return. Grain automatically dumps from the hopper in manual or automatic advance mode.

- Automatic Return advances from the Analysis screen to the Sample ID screen within a specified period of time (4 to 20 seconds) without pressing the **Initiate** button.
- Manual Return advances to the Sample ID screen to perform another test by pressing the **Enter** button after each test.
- Bottomless Drawer in Use must be enabled when the bottomless drawer style is used with a flow-through counter to prevent an empty drawer caution from occurring when running tests.
  - Grain can also be tested without the grain drawer secured in the unit when Bottomless Drawer in Use is enabled; however, a Drawer Ignored screen appears each time a test is performed and will only proceed to perform test when the **Initiate** button is pressed.

***Figure 23***

***Result Screen***



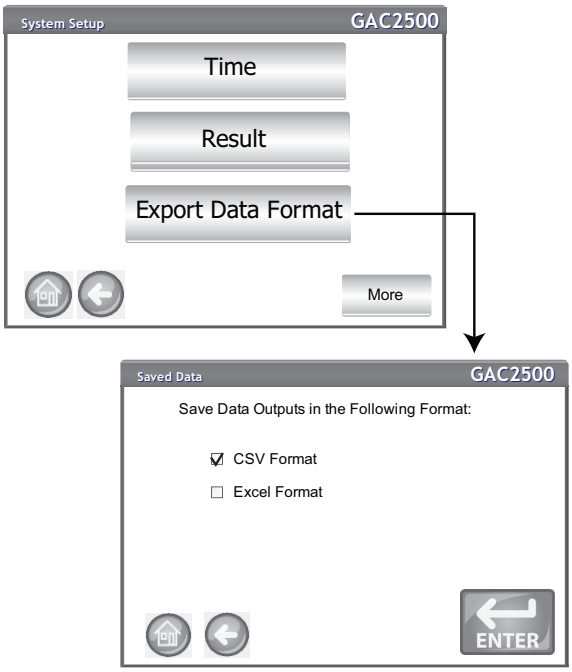
## EXPORT DATA FORMAT

Data can be saved for output to a computer in an Excel or CSV format. The unit default is CSV.

1. At the System Setup screen, press the the **More** button until the **Export Format** button appears.
2. Enable the check box of the desired output.
3. Press the **Enter** button to accept.

***Figure 24***

***Data Format Screen***



## UNITS

The Units screen allows selection of:

- Date format (UK or Euro)
- Temperature (degrees F or C)
- Unit measurement for test weight (lb/bu or kg/hl)
- Radix point (, or .)
- Moisture, test weight, and temperature display resolution (tenths or hundredths)

Test Weight defaults to display on the Analysis Results screen but can be removed by disabling at the Sample Setup screen.

**Unit defaults:**

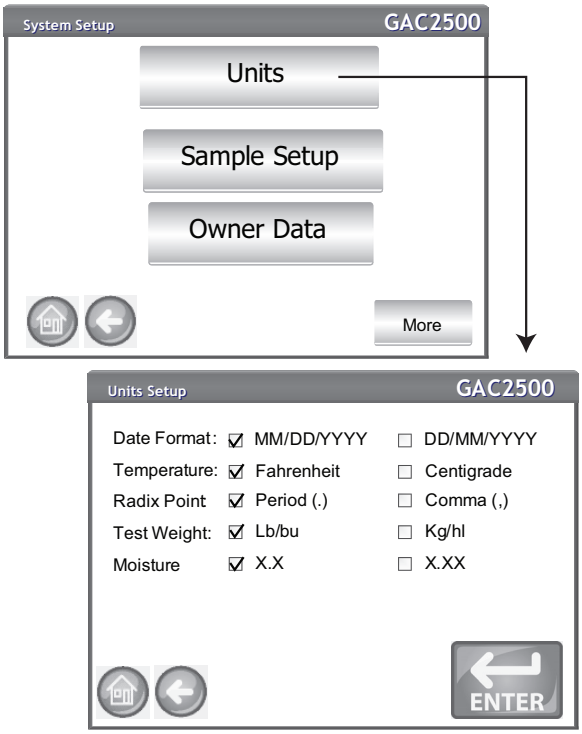
- Date (US - MM/DD/YYYY)
- Test weight (lbs/bu)
- Temperature (degrees F)
- Radix point (Period - .)
- Moisture (tenths)

**To Change Units:**

1. At the System Setup screen, press the the **More** button until the **Units** button appears.
2. Press the **Units** button to display the Units Setup screen.
3. Enable the respective check boxes.
4. When selected, press the **Enter** button to accept.

***Figure 25***

***Units Screen***



## SAMPLE SETUP

A Sample ID, Customer ID, User Name (Login), Grain Temperature, and Test Weight can be enabled so that a grain sample is identified and saved with this information each time a test is performed.

1. At the System Setup screen, press the the **More** button until the **Sample Setup** button appears.
2. Enable the check box of desired ID's required when running samples.
3. Press the **Enter** button to accept.

**Sample ID**

Requires a Sample ID to be associated with each grain test and prints to ticket. Sample ID default is enabled.

**Sequence Sample ID**

Automatic number sequencing to the next higher number will occur with additional tests of the same grain. Sequence Sample ID default is enabled.

**Customer ID Required**

Requires a Customer ID to be associated with each grain test and prints to ticket. Customer ID default is disabled.

**User Login Required**

*User*

A User Login requires a tester to login with a user name at the Main Menu screen before grain can be analyzed. If a user login is required, the user name entered at the User Login screen is recorded in the unit's database and prints on the print ticket. The **User** button only appears on the Main Menu screen when enabled. User Login default is disabled.

**Display Test Weight**

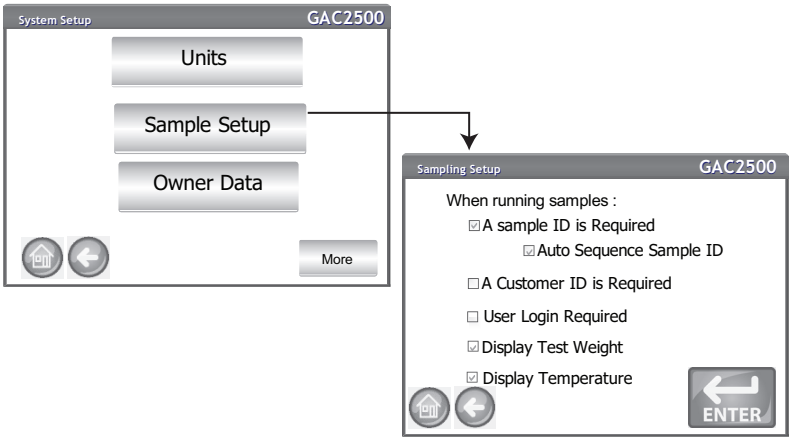
Test weight displays on Results screen for each test. Display Test Weight default is enabled.

**Display Temperature**

Display Temperature displays on Results screen for each test. Display Temperature default is enabled.

***Figure 26***

***Sample Setup Screen***



## OWNER DATA

Enter name, address, and phone information, if desired. Data entered at this screen can be used as the header/footer on a print ticket.

This data can also be viewed by pressing the **Instrument Information** button found on the Main Menu screen, refer to Printer Setup.

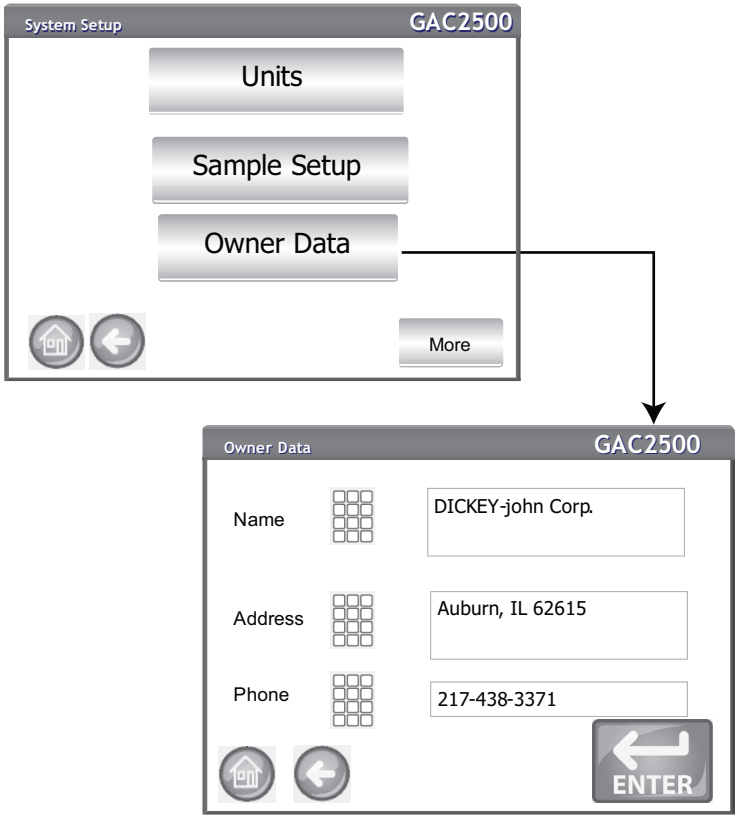
*Instrument Information*

1. At the System Setup screen, press the **More** button until the **Owner Data** button appears.
2. Press the **Owner Data** button and enter name, address, phone number by pressing the keypad icon.
3. Press the **Enter** button when finished.

*NOTE: An external keyboard, barcode scanner, or mouse can be used to enter data.*

***Figure 27***

***Owner Data Screen***



## SERVICE DATA

The Service Data screen provides text entry fields for technicians to enter comments regarding service performed on the unit and service date.

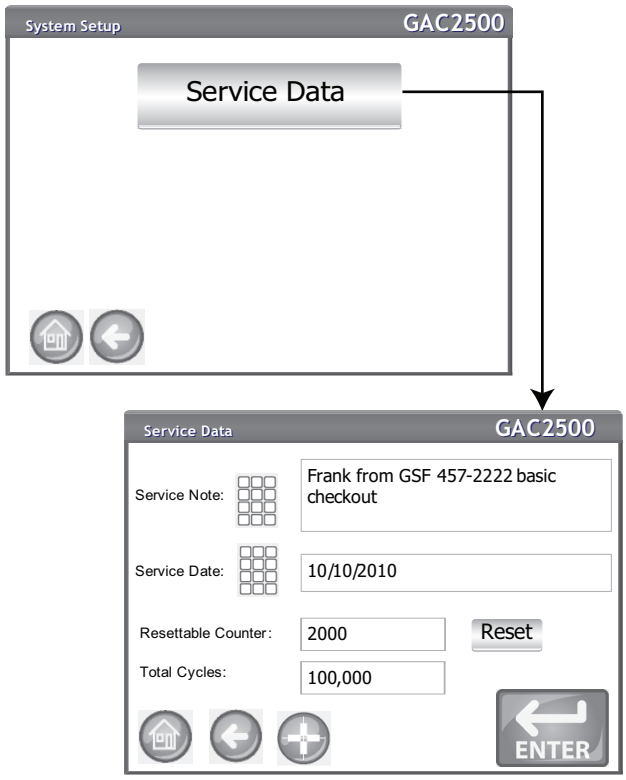
- Resettable Counter resets the number of tests to 0.
- Total Cycles indicates the number of tests performed over the life of the unit and is not resettable.

1. At the System Setup screen, press the **More** button until the Service button appears.
2. Press the **Service Data** button to display the Service Data screen.
3. Enter notes and date by pressing the keypad icon.
4. Press **Reset** button to set counter to 0, if desired.

*NOTE: An external keyboard, barcode scanner, or mouse can be used to enter data.*

***Figure 28***

***Service Screen***



## LCD DISPLAY TOUCH SCREEN CALIBRATION

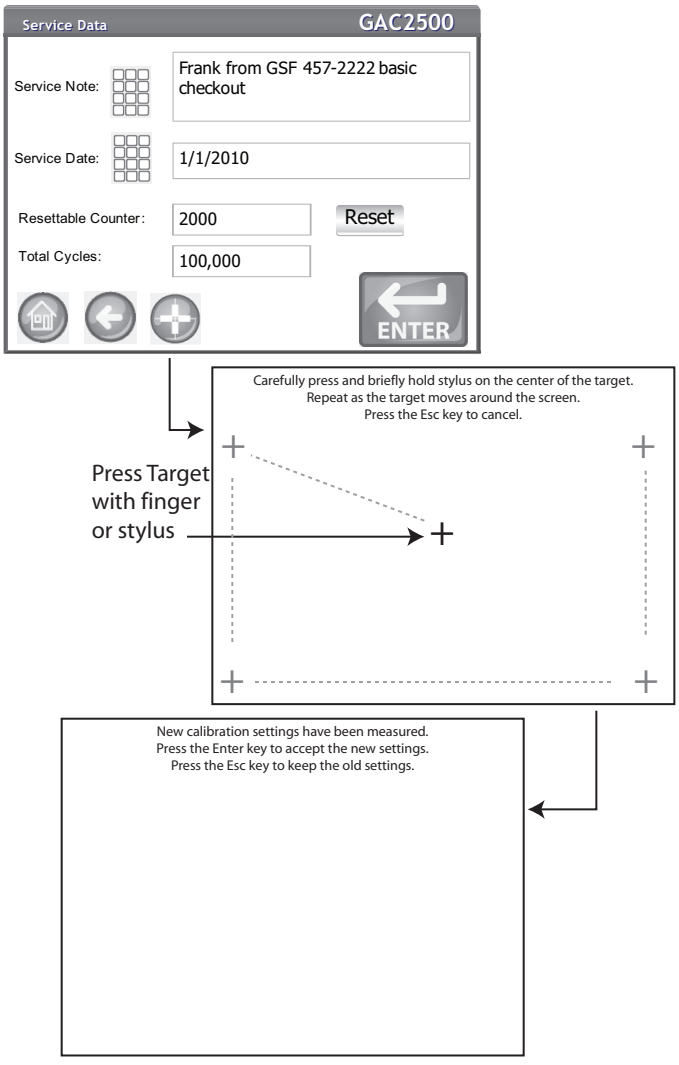
The LCD display touch screen may not respond as it should with a finger touch or stylus after a period of time or if subjected to extreme temperature changes. The display can be re-calibrated to improve responsiveness.

*Display Touch Screen Calibration*

1. At the Service Data screen, press the **Display Touch Screen Calibration** button and follow onscreen instructions.
2. Carefully press and hold finger on the center of the target.
3. Repeat as the target moves around the screen.
4. With a keyboard attached, press the **Enter** button to accept new settings or the **Esc** button to keep previous settings. Without an attached keyboard, press anywhere on the screen to accept.

***Figure 29***

***Display Calibration***


Service Data
GAC2500
Service Note:
Frank from GSF 457-2222 basic checkout
Service Date:
1/1/2010
Resettable Counter:
2000
Reset
Total Cycles:
100,000
ENTER
Carefully press and briefly hold stylus on the center of the target.
Repeat as the target moves around the screen.
Press the Esc key to cancel.
Press Target with finger or stylus
New calibration settings have been measured.
Press the Enter key to accept the new settings.
Press the Esc key to keep the old settings.

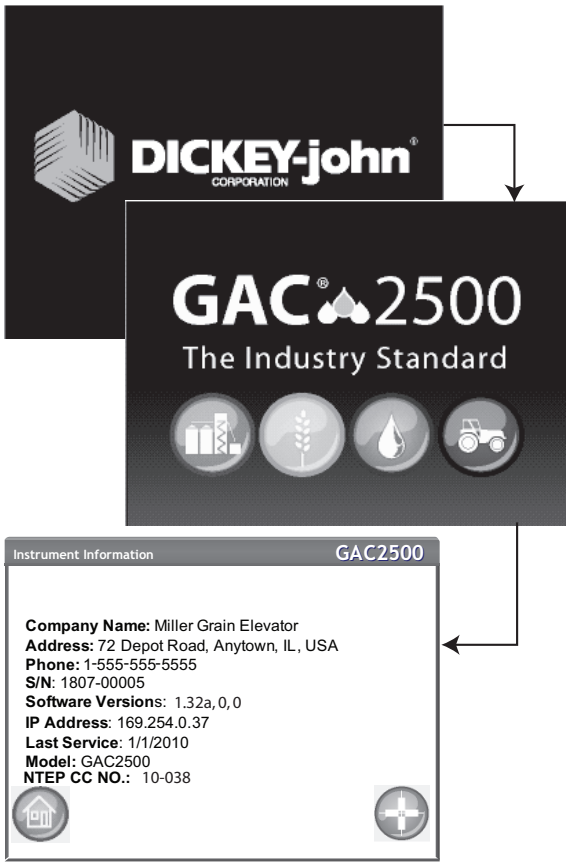
# STARTUP

The GAC® 2500 is powered on by pressing the on/off switch located on the front panel (Figure 1). A series of Startup screens load after the system is turned on. A status bar will indicate self checks are occurring and upon completion, the Instrument Information screen is displayed for several seconds before the Main Menu screen displays.

**IMPORTANT: On initial power up of the unit, the system defaults with open access to all screens. To ensure that the unit's settings are protected and accessible by qualified users, an administrative level with password should be created. Refer to the System Setup section for further information.**

***Figure 30***

***Startup Screens***



*Virtual Power Down*

## POWER DOWN

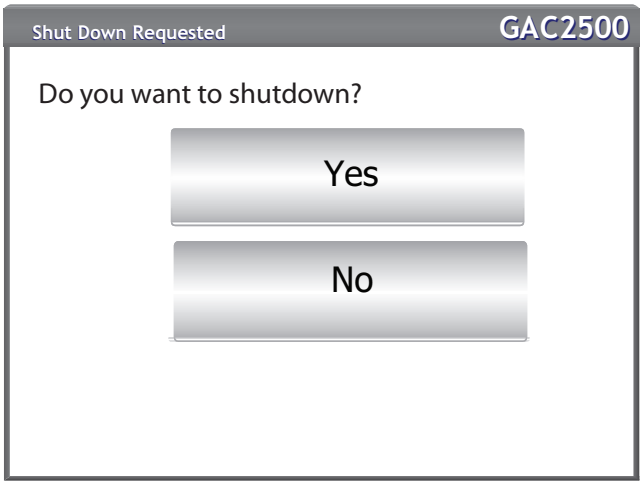
The unit can be powered down from any screen by pressing the on/off switch located on the front panel.

A virtual **Power Down** button is also available on some top level screens and powers off the unit in the same manner as the on/off switch.

A Power Down screen must be acknowledged before the unit will shut down.

***Figure 31***

***Power Down Screen***



# ANALYZING GRAIN

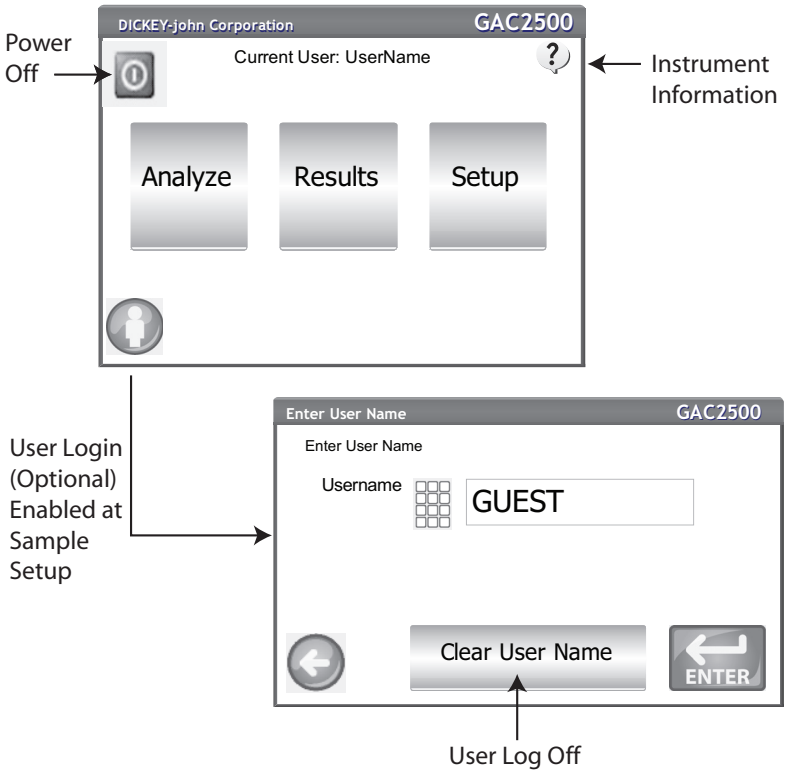
The Main Menu screen appears after all Startup screens have loaded. This is the "Home" menu through which all other menus are accessed.

At the Main Menu screen, three functions are performed:

1. To analyze grain
2. To access test results
3. To setup/customize the unit

***Figure 32***

***Main Menu (Home) Screen***




## USER LOGIN (OPTIONAL)

*User*

A User Login is an optional feature that requires a user to login before grain can be analyzed. The unit default is no user login required. If a user login is required, a **User** button appears on the Main Menu screen. The User cannot proceed to test grain until a login name is entered. The User Login feature records the user name with a grain test in the unit database, is viewable in the Audit Trail, and prints on each grain ticket.

## USER LOGIN

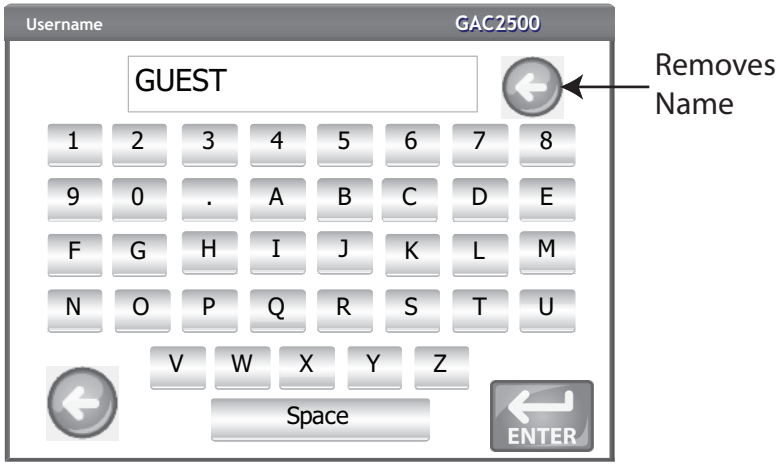
*NOTE: Refer to the System Setup, Sample Setup section to enable user login.*

1. At the Main Menu screen, press the **User** button.
2. GUEST appears as the default User Name and must be replaced with a different user name. Press the keypad icon to enter a new user name.

*User*

***Figure 33***

***User Login Keypad***




3. Press the **Enter** button to accept. The user name will appear as the current user on the Main Menu screen.

The unit will continue to analyze grain with the active user name until the user logs off or the power is turned off.

## USER LOG OFF

1. At the Main Menu screen, press the **User** button.
2. At the User Login screen, press the **Clear User Name** button. GUEST will default as the new user name.
3. Press the **Enter** button to return to the Main Menu screen.
4. A new user name must be entered before additional grain analysis is allowed.

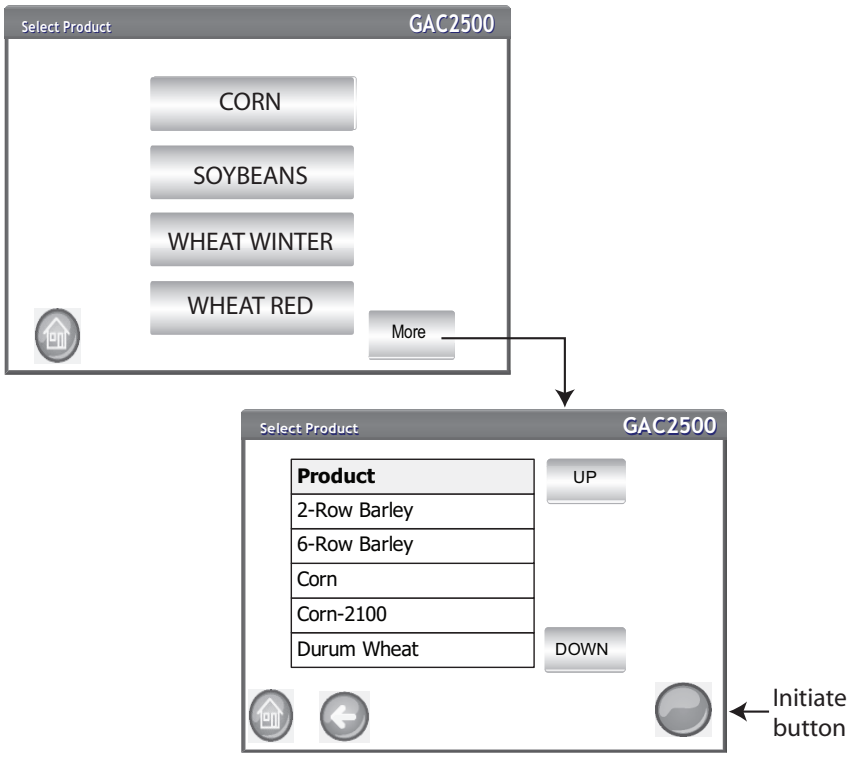
# SELECTING PRODUCT

**To select a grain for testing:**

1. At the Main Menu screen, press the **Analyze** button.
   A pre-defined list of 4 grains appear on the Select Product screen. After grain selection, grains will then be saved in a "last used" order.
2. To view additional grains not viewable on the top level Select Product screen, press the **More** button.

*Figure 34*

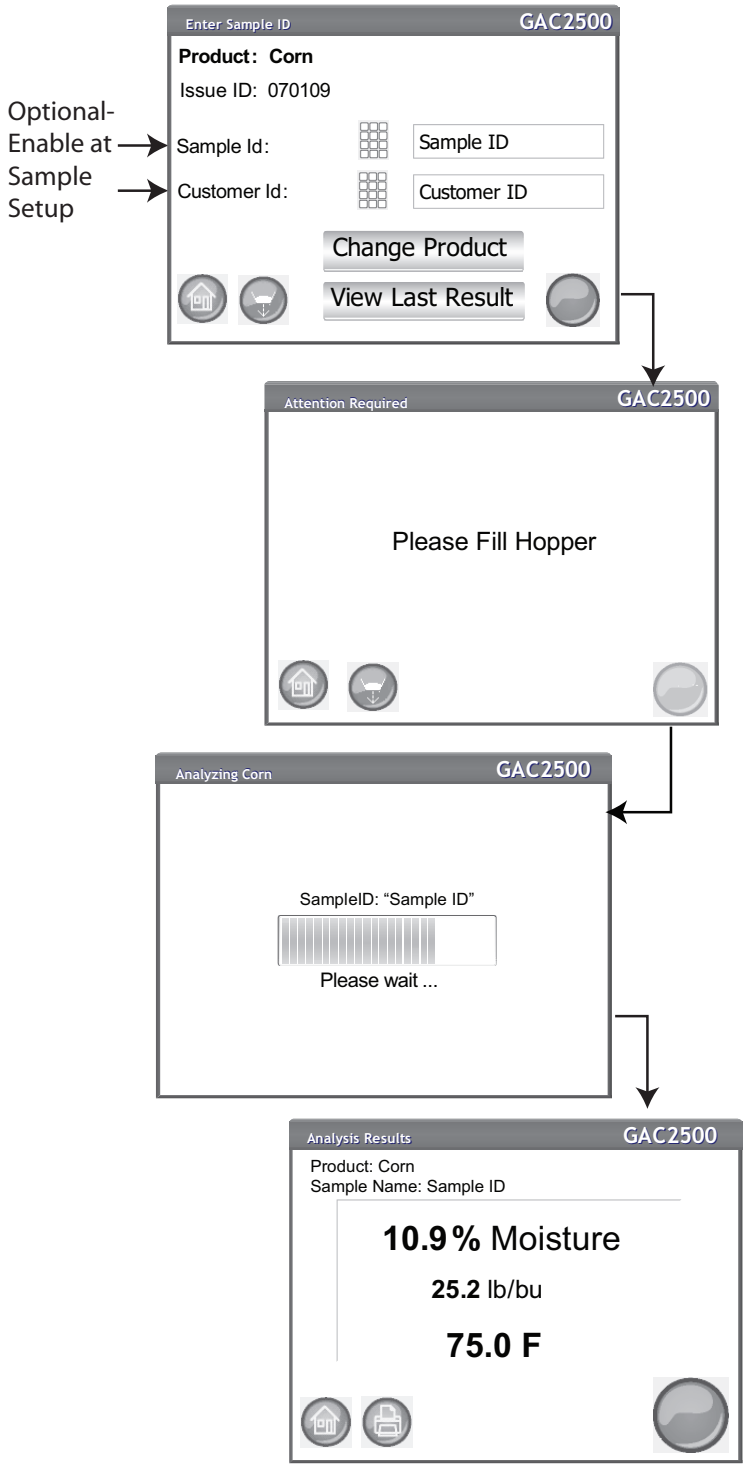
***Select Product***




3. Press the **Up** and **Down** buttons to view grains.
4. Press the desired grain in the product table.
5. Once selected, press the **Initiate** button to accept.
6. The selected product and Issue ID displays at the top of the Sample ID screen.
   – The **Change Product** button allows selection of a different product.
7. A Sample ID and Customer ID are optional entries unless required under System Setup.
8. A SampleID name can be entered by pressing the keypad located next to the input box.
   – Automatic number sequencing to the next higher number will occur with additional tests of the same grain (1,2,3, etc). If auto sequence is not selected, the previous tests sample ID is cleared.

*Figure 35*

***Sample ID Screen***




9. Press the **Initiate** button (green) to proceed.
10. Pour grain into the hopper heaping grain slightly up to the hopper full sensors.

11. Follow onscreen instructions.
12. Press the **Initiate** button (green) to begin test. Grain will dump into the measurement cell from the hopper. A test will only perform when the **Initiate** button is green.
13. The cell fills and the striker arm swings across the top of the test cell to wipe away excess grain.

*NOTE: A yellow **Initiate** button indicates an action must be taken before a test can begin. Follow onscreen instructions until button turns green.*

14. During analysis, a testing status bar indicates progress.
15. An audible alarm indicates when test is complete and automatically advances to the Analysis Results screen.

**⚠CAUTION**

**Do not insert fingers or foreign objects into the opened hopper doors.**

*NOTE: To automatically return to the Sample ID screen without pressing the **Initiate** button refer to the System Setup, Results Setting section for enabling Automatic Return.*

16. The Analysis Results screen displays:
    - Product tested
    - Sample name
    - Moisture content %
    - Test Weight lbs/bu or kg/hl (optional)
    - Temperature (optional)
17. Test results are automatically saved to the unit.
18. If the unit is set to Manual advance after each analysis, press the **Initiate** button to return to the Sample ID screen to enter the next sample name and then initiate another test.

Grain automatically dumps into the drawer for removal in Manual or Automatic advance.

Drawer capacity holds approximately 3 tests. After 3 tests the drawer must be emptied before proceeding.

**IMPORTANT: When using a bottomless grain drawer with flow-through counter, the bottomless drawer feature should be enabled under System Setup, Result Settings to perform unlimited grain tests to eliminate error messages.**

Grain will not dump out of the cell if drawer is not present or secure.

*Print*

**Other Actions:**

- **Print** button sends test results to a local printer.
- **Home** button returns to the Main Menu screen.

*Home*

Refer to the Error Message section for probable causes and corrective actions if errors occur during analysis.

Refer to the Save Results section and Printing Options section for output options.

# RESULTS

The Results screen provides access to grain test results, product list, and audit trail.

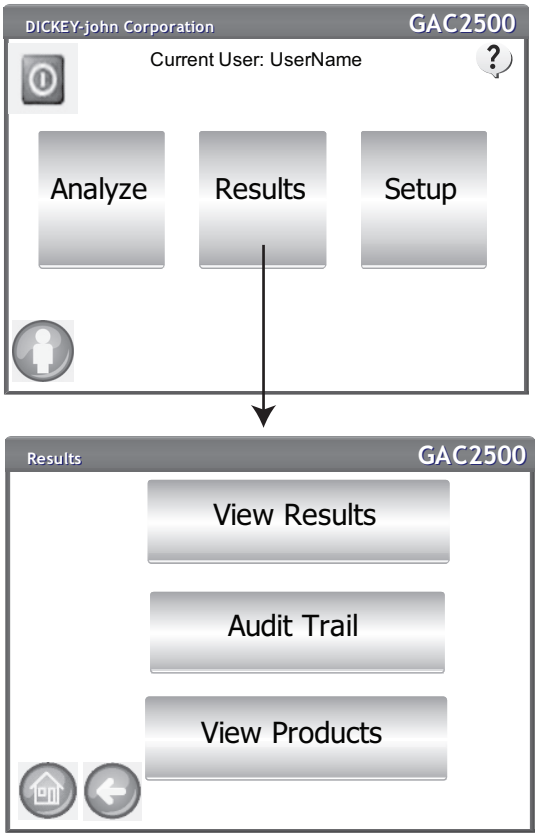
**To View Test Results:**

1. At the Main Menu screen, press the **Results** button.
2. At the Results screen, press the **View Results** button.

*NOTE: A momentary pause may occur before test results appear on screen. Do not press any buttons during this time.*

***Figure 36***

***View Results***



***Print***

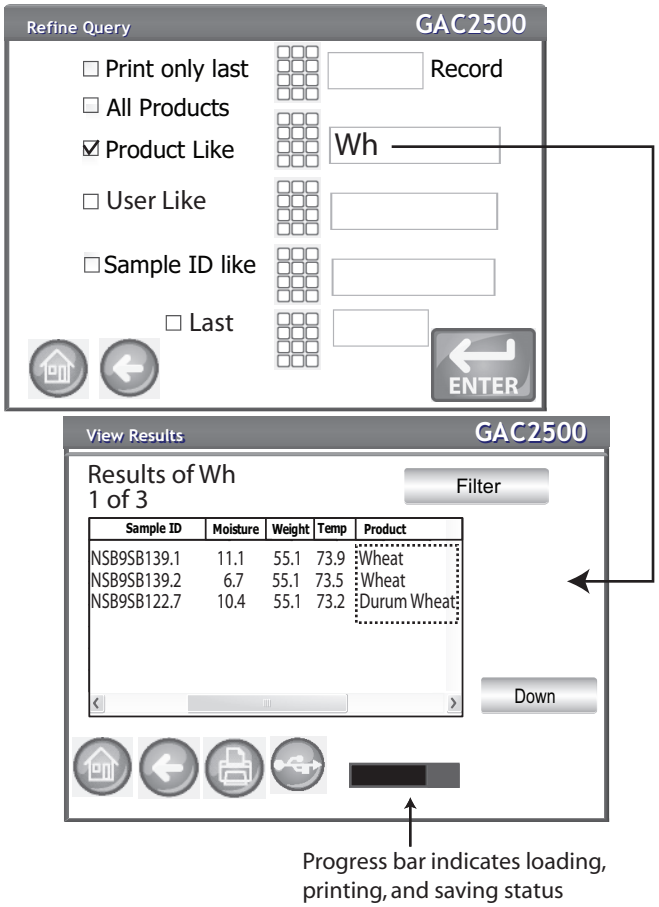
*USB*

3. The Results screen default displays all test results with Sample ID, % Moisture, Weight, Temperature, Product, Issue No., Customer ID, User ID, Date and Time.
4. Press the **Filter** button to choose what events display on the test results record. Refer to Refine Query Options for criteria options.
5. Press the **Print** button to print results as displayed in the table on the Results screen.
6. Insert USB memory device and press the **USB** button to transfer product results to a computer. All results are transferred to USB regardless of Filter setting.

# REFINE QUERY OPTIONS

***Figure 37***

***Product Like Criteria Example***




Results can be filtered to display based on one or all of the following criteria:

## PRINT ONLY LAST NUMBER OF RECORDS

Allows entry of a specified number of records to display or print starting with the last sample taken, such as printing the last 5 samples taken.

*NOTE: A status bar indicates progress of retrieving filtered data. Results can take several minutes to load while retrieving data. Do not press any buttons during this time.*

## ALL PRODUCTS

Prints all sample tests stored on instrument.

## PRODUCT LIKE

Allows entry of part or all of the product name to perform a product search. All records that fit criteria entered in the Product Like filter search will display. Example: Searching for a product like "Wh" searches for all records with "Wh" in the product name. (Figure 37) displays results for Wheat and Durum Wheat.

*NOTE: User Like and Sample ID Like filter function works the same as the Product Like filter. Refer to (Figure 37)*

## USER LIKE

Allows entry of part or all of the User name to perform a search for similar records within the User field. All records that fit the criteria entered in the User Like filter search will display.

## SAMPLE ID LIKE

Allows entry of part or all of the Sample ID name to perform a search for similar records within Sample ID. All records that fit the criteria entered in the Sample ID Like filter search will display.

## DATA STORAGE CAPACITY

The unit is capable of storing 30,000 test results. When the unit has reached its limit of storing test results, a Delete Results screen appears and one of the following actions must be selected:

- Delete oldest 100 records
- Delete oldest 10,000 records
- Delete/clear all records
- Download and clear all records

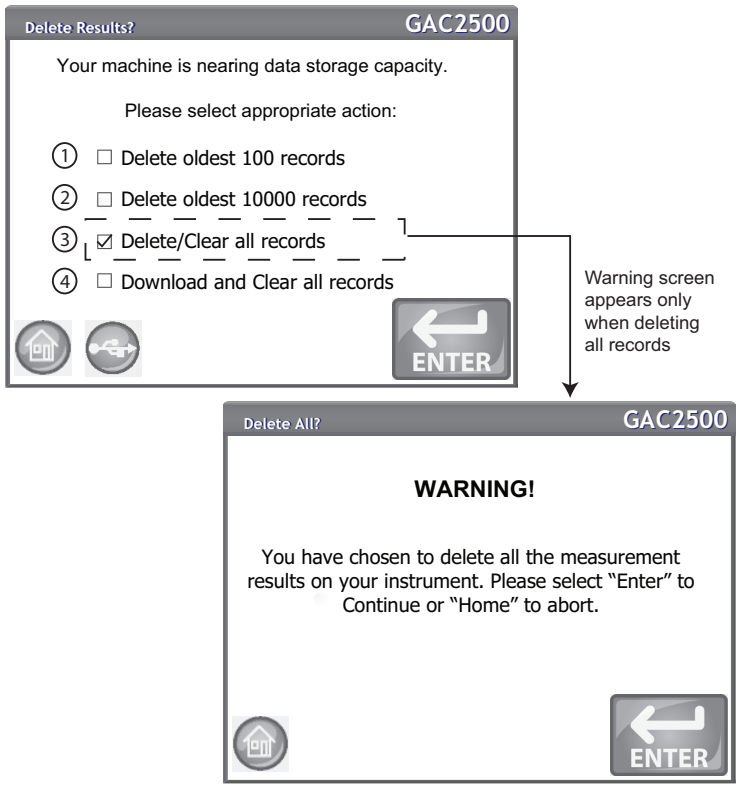
**To Delete Records:**

*USB*

1. At the Delete Results screen, select the desired action.
2. Press the **Enter** button to delete/clear records (reference item 1, 2, 3 in (Figure 38). After records are cleared, previous screen appears and testing can continue.
   – A Warning screen displays when "Delete/Clear all records" is selected. This warning does not appear when the oldest 100 or 10,000 records deletion is selected.
3. Press the **USB** button to download all records to a USB memory device (reference item 4 in (Figure 38). After download is complete, press the **Enter** button to return to previous screen and continue testing. All records will be cleared from the instrument.

***Figure 38***

***Delete Results Screen***


Delete Results?
GAC2500
Your machine is nearing data storage capacity.
Please select appropriate action:
① ☐ Delete oldest 100 records
② ☐ Delete oldest 10000 records
③ ☑ Delete/Clear all records
④ ☐ Download and Clear all records
ENTER
Warning screen appears only when deleting all records
Delete All?
GAC2500
WARNING!
You have chosen to delete all the measurement results on your instrument. Please select "Enter" to Continue or "Home" to abort.
ENTER

## AUDIT TRAIL

Any changes that relate to system functionality and testing are recorded and stored. The Audit Trail provides a log of these changes.

**To View Audit Trail:**

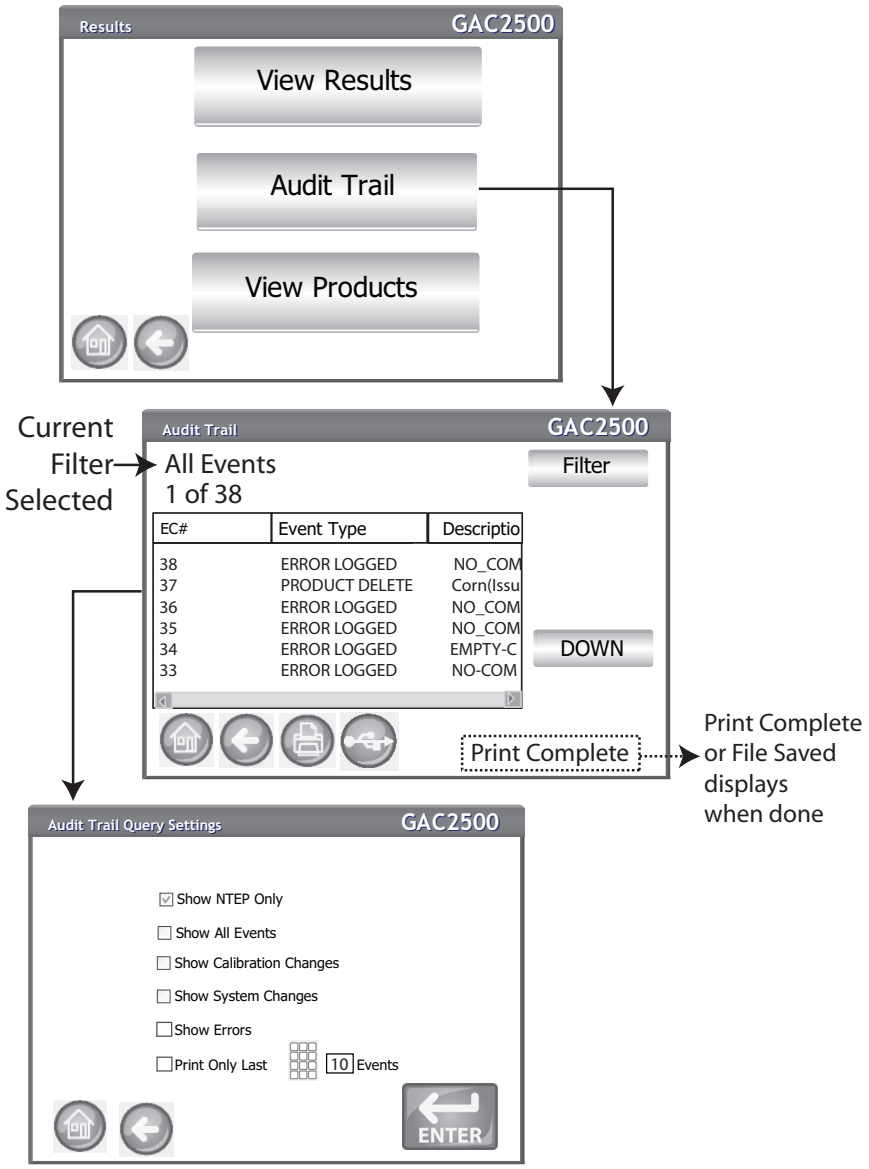
1. At the Results screen, press the **Audit Trail** button.
2. The Audit Trail screen displays
   - Event Counter (EC#) (number assigned to each change)
   - Event Type
   - Description
   - User
3. Press the **Filter** button to choose what events display on the Audit Trail record or to obtain an NTEP audit trail display.
   - Show NTEP only (when selected, all other options are unchecked)
   - Show All Events (when selected, all other options are unchecked)
   - Show Calibration Changes
   - Show System Changes
   - Show Errors
   - Print only a certain number of events
4. Press the **Print** button to print results as displayed on the Audit Trail screen. If the printer output format is PRN80, PRN81, CSV01 or NTEP, the output format is CSV. All other formats print in strip.
5. Insert a USB memory device and press the **USB** button to transfer Audit Trail results as displayed on the Audit Trail screen to a file for transfer to a computer.

*Print*

*USB*

***Figure 39***

***Audit Trail***



# VIEW PRODUCTS

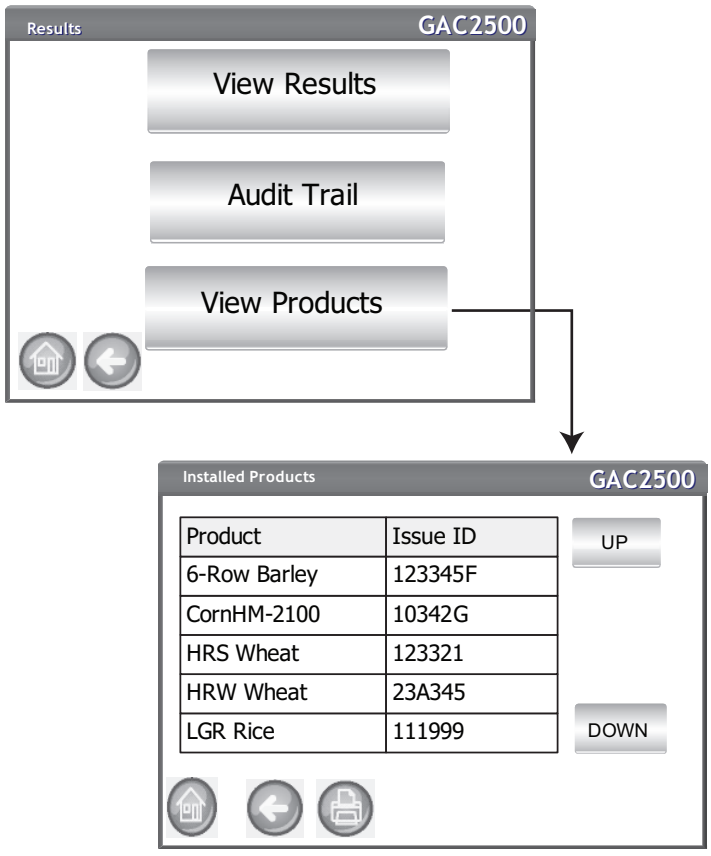
The Installed Products screen provides an alphabetical table of active products stored on the unit with respective Issue ID. Products can only be viewed and printed at this screen.

1. At the Results screen, press the **View Products** button.
2. Press the **Print** button to print all active products and respective Issue ID's.

***Print***

***Figure 40***

***View Products Screen***



# GRAIN CALIBRATIONS

Grain calibration files will be available for download at the DICKEY-john website (www.dickey-john.com) for transfer to the GAC® 2500 via a USB memory device.

These files are also available through DICKEY-john Technical Support Group at 1-800-637-3302.

# MAINTENANCE

## EXTERNAL CLEANING

The GAC® 2500 surface can be cleaned with any cleaner designed for plastic and stainless steel surfaces.

## INTERNAL CLEANING

It is recommended that the internal hopper and testing cell be cleaned periodically.

1. Unplug power cord.
2. Remove grain drawer.

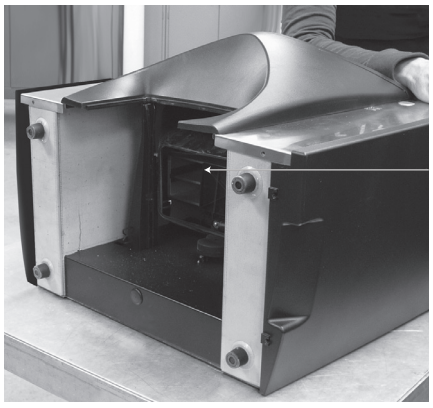
***Figure 41***

***Remove Grain Drawer***

3. Place the unit on its side.

***Figure 42***

***Place Unit on Side***




4. Open the hopper door and use supplied brush to remove dust and grain particles in the cell.

*Figure 43*

***Open Cell Unload Door and Clean***

***Cell Unload Door***

*Figure 44*

***Clean Cell***

5. Return unit to its upright position.
6. Replace grain drawer.

## LCD DISPLAY

The LCD display may require periodic cleaning. Use a commercial cleaner for glass lenses to remove dust.

**CAUTION**

**Do not apply water, organic solvent or chemicals, such as acid and alkali to the LCD display.**

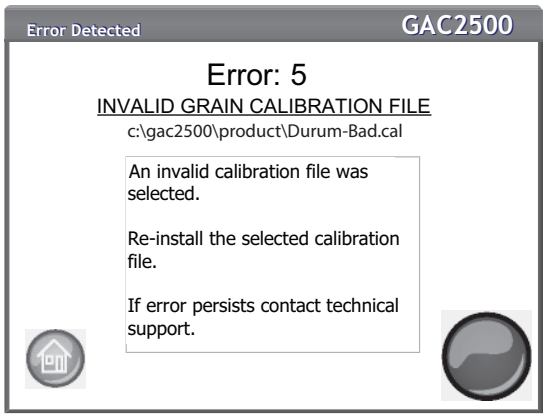
# TROUBLESHOOTING

If the system locks, press and hold the on/off button on the front of machine until system turns off or unplug instrument power. Wait a few seconds and then power on.

The GAC® 2500 contains a microprocessor to control grain sample measurements and self-checks that determine the integrity of the internal electronics. If any limit is exceeded or malfunctions occur an error code displays with a recommended resolution.

***Figure 45***

***Error Screen Example***



## ERROR MESSAGES

Error messages display when an abnormal event occurs. An error can be acknowledged by pressing the **Initiate** button. For any failure that persists, contact DICKEY-john Technical Support at 1-800-637-3302.

| ERROR CODE | ERROR | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|---|
| 1 | Empty Cell Measurement Out of Spec | Moisture or dirt buildup in cell. | Dump grain and verify cell is clean and free of grain in and surrounding the cell. |
| 2 | Empty Cell Weight Out of Spec | Empty cell measurement is out of tolerance | Dump grain and verify cell is clean and free of grain in and surrounding the cell. |
| 3 | No Products Installed | No product calibrations were found on the machine. | Install product calibration files. |
| 4 | Fill Motor Jammed | The motor has stalled while loading grain from a possible obstruction. | Clear blockage from cell. |
| 5 | Invalid Grain Calibration File | An invalid calibration file was selected. | Re-install the selected calibration file. |
| 6 | Moisture Too High | Measured product is above the moisture upper limit of the calibration. | Verify sample filled the cell. |
| 7 | Moisture Too Low | Measured product is below the moisture lower limit of the calibration. | Verify sample filled the cell. |
| 8 | Instrument Low Temp Limit Exceeded | Instrument temperature is less than the allowed limit of 0 degrees C. | Move unit to a warmer environment or allow to warm up. |
| 9 | Grain High Temp Limit Exceeded | Grain temperature has exceeded the unit specification to analyze grain. | Allow grain to cool and then re-analyze. |
| 10 | Grain Low Temp Limit Exceeded | Grain temperature has exceeded the unit specification to analyze grain. | Allow grain to warm and then re-analyze. |
| 11 | Sample Weight Too High | Test weight is greater than the range specified for the calibration selected. | Use a more representative sample and re-analyze grain.<br>Verify correct grain calibration is selected. |
| 12 | Sample Weight Too Low | Test weight is lower than the range specified for the calibration selected. | Use a more representative sample and re-analyze grain.<br>Verify correct grain calibration is selected. |
| 13 | No Communication | An internal communication failure has occurred and communication has been lost. | Power unit off and turn back on to reset. |
| 14 | Instrument High Temp Limit Exceeded | Instrument temperature is higher than the allowed limit of 45 degrees C. | Check unit ventilation or move to a cooler environment. |
| 15 | Unit to Grain Differential | The difference between grain temperature and machine temperature has exceeded the unit specification to analyze grain. | Allow grain and machine temperature to equalize and then re-analyze. |
| 16 | Internal Power Supply Out of Spec | Unit internal voltage is out of specification. | Service is required. Contact DICKEY-john Tech Support at 1-800-637-3302. |
| 17 | Unable to Predict Moisture | A corrupt instrument calibration file or other unexpected error. | Dump sample and re-analyze. |
| 19 | Instrument Needs Updated | Firmware in the instrument is out of date for this application. | Update device with new firmware. |
| 21 | File I/O Error | An unexpected file i/o error has occurred. | An obstruction has occurred in the cell. Blockage must be cleared before testing can resume. |
| 50 | Weight Measurement Device Error | An error has occurred with the load cell. | Power unit off and turn back on to reset.<br>Service unit if failure continues. |
| 51 | Invalid Password | A service function with an invalid password was attempted. | If service is required, contact DICKEY-john Technical Support at 1-800-637-3302 for assistance on how to obtain the password and proper service procedure. |
| 52 | Date/Time Incorrect | The programmed machine date is less than expected. | Program the instrument date and time. If problem persists, then the battery backup for the internal clock may need to be replaced. Contact DICKEY-john Technical Support at 1-800-637-3302 for service. |
| 53 | Cold Sample Moisture Too High | The sample is too high in moisture to accurately read at its current temperature. | Warm the sample above the low temperature threshold specified in the product calibration file and rerun the measurement. |
| 55 | Dump Motor Timeout | The dump mechanism does not appear to be closing. | Check that the dump motor optical sensor is clean and there is no interference in the dump mechanism. Press the Green button to retry. If error persists, contact technial support at 1-800-637-3392. |
| 100 | Unexpected Application Crash | The application has encountered an unexpected error. | Press the Initiate (green) button or cycle power to reboot the instrument. If problem persists, contact Dickey-john Tech Support at 1-800-637-3302. |

*Dealers have the responsibility of calling to the attention of their customers the following warranty prior to acceptance of an order from their customer for any DICKEY-john product.*

# *DICKEY-john® WARRANTY*

DICKEY-john warrants to the original purchaser for use that, if any part of the product proves to be defective in material or workmanship within one year from date of original installation, and is returned to DICKEY-john within 30 days after such defect is discovered, DICKEY-john will (at our option) either replace or repair said part. This warranty does not apply to damage resulting from misuse, neglect, accident, or improper installation or maintenance; any expenses or liability for repairs made by outside parties without DICKEY-john's written consent; damage to any associated equipment; or lost profits or special damages. Said part will not be considered defective if it substantially fulfills the performance expectations. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE, AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED. DICKEY-john neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with said part and will not be liable for consequential damages. Purchaser accepts these terms and warranty limitations unless the product is returned within fifteen days for full refund of purchase price.

**For DICKEY- john Service Department, call**
**1-800-637-3302 in either the U.S.A. or Canada**

DICKEY-john® CORPORATION

**Headquarters**:
5200 Dickey-john Road, Auburn, IL USA 62615
TEL: 217 438 3371, FAX: 217 438 6012, WEB: www.dickey-john.com

**Europe**:
DICKEY-john Europe S.A.S, 165, boulevard de Valmy, 92706 – Colombes – France
TEL: 33 (0) 1 41 19 21 80, FAX: 33 (0) 1 47 86 00 07 WEB: www.dickey-john.eu

Copyright 2010 DICKEY-john Corporation
Specifications subject to change without notice.
Issue Date December 2010